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Review



## Market Available Herbal Antioxidant in Cosmetics

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	<b>Abstract</b>
Published on: 04 Sep 2025	<p>The potential of herbal antioxidants to shield the skin from oxidative stress, premature aging, and environmental damage has made them essential ingredients in contemporary cosmetic compositions. Commonly used in skincare and hair care products are commercially available herbal extracts including green tea (<i>Camellia sinensis</i>), turmeric (<i>Curcuma longa</i>), and grape seed (<i>Vitis vinifera</i>), rosemary extract (<i>Rosmarinus officinalis</i>), neem extract (<i>Azadirachta Indicia</i>), aloe vera (<i>Aloe barbadensis</i>). Phenolic compounds, flavonoids, and tannins found in these natural antioxidants help to protect skin by scavenging free radicals. These compounds have been effectively marketed by companies such as Lotus Botanicals, Himalaya Herbals, Forest Essentials, and The Body Shop in lotions, creams, face serums, and sunscreens. The chemical makeup, modes of action, and cosmetic uses of herbal antioxidants that are currently on the market are highlighted in this article. The review examines the botanical name, benefits, and current trends of the herbal antioxidants that are often used in cosmetics, including anti-aging creams, serums, sunscreen, moisturizers and more.</p>
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## INTRODUCTION

Pharmaceutical goods known as cosmetics are intended to improve the appearance of skin and body odor. They come in a variety of forms, including lotions, creams, powders, and more. These are applied to the skin to cleanse, protect, and moisturize it (1). Because of the frequent use of oxygen, the body produces free radicals, which can be reduced by foods, contain a family of chemicals called antioxidants (2). To lessen oxidative stress on the skin, the cosmetics industry uses a variety of natural antioxidants, such as substances and fruit and plant extracts (3). Antioxidants fall into categories: Secondary antioxidants and natural antioxidants

(4). Natural antioxidant advantages found in cosmetics products include anti-aging, anti-inflammatory, and antimicrobial qualities.

#### CLASSIFICATION OF ANTIOXIDANTS (6)

1. Natural Antioxidant
2. Synthetic Antioxidant

#### 1. NATURAL ANTIOXIDANT

- a. Exogenous
- b. Endogenous

##### a. EXOGENOUS:

- VITAMIN:
  - Ascorbic acid
  - Tocopherols
  - Retinol
- TRACE ELEMENT:
  - Selenium
  - Zinc
- CAROTENOIDS
  - $\alpha$ -carotene,  $\beta$ -carotene
  - Lycopene
  - Cryptoxanthin
- POLYPHENOLS:
  - Flavones
  - Anthocyanins
  - Phenolic acid

##### b. ENDOGENOUS:

##### 1. ENZYMATIC:

- Primary defense system:
  - Catalase, Superoxide dismutase
- Secondary defence system:
  - Glucose-6- phosphate dehydrogenase
  - Glutathione reductase

##### 2. NON - ENZYMATIC:

- Low molecular weight:
  - Lipophilic: lipoic acid, ubiquinone
  - Hydrophilic: Uric acid, Glutathione
- Metal- binding proteins:
  - Ferritin
  - Albumin

#### 2. SYNTHETIC ANTIOXIDANT

- Phenolic structures:
  - BHA (Butylated hydroxyanisole)
  - BHT (Butylated hydroxytoluene)
- Nano- antioxidants
  - Dendrimers
  - Metal oxide NPs
  - Nanogel

#### MARKET AVAILABLE HERBAL ANTIOXIDANTS

##### 1. TURMERIC EXTRACT: (Curcumin)

- Botanical Name: *Curcuma longa*
- Family: Zingiberaceae(7)

Since women have historically applied turmeric to the skin, it may be the earliest known cosmetic. It is thought to improve complexion, lessen acne and stop the growth of facial hair (8). Turmeric is a skin food because it nourishes and purifies the blood, which leads to skin that, is healthy and radiant. It is great for skin condition including acne, skin malignancies, ect, and helps to prevent premature aging because of its antibacterial and antiseptic properties s(9).

Demetossicurcumin (17%), and bisdemetossicurcumina (3%) and curcumin (77%), are the constituents of turmeric. Also included is volatile oil (10).

- USES OF TURMERIC IN COSMETIC:
  - Free radicals are scavenged, and the signs of aging are slowed.
  - Due to its antimicrobial qualities, turmeric can be used to treat small cuts on the skin.
  - It is used for wrinkles.
  - Curcumin has antioxidant properties to protect the skin from UV ray
  - Reduction of hyper pigmentation (11).
- EXAMPLE: Such as Creams, lotion, moisturizers (12).



Fig 1: Turmeric Extract (13)

## 2. ROSEMARY EXTRACT: -9+63

- BOTANICAL NAME: *Rosmarinus officinalis*
- FAMILY: Lamiaceae (14)

The high antioxidant properties of rosemary are a major factor in its potential for use in skincare product. Free radicals, which are known to hasten skin aging by causing oxidative damage to cellular components like collagen and elastin, are efficiently neutralized by the phenolic chemicals like as rosmarinic acid that are present in rosemary(15).

The most often researched compounds associated with rosemary include ursolic acid (6%) ,carnosic acid (30%), rosmarinic acid(12%), and volatile essential oil (27%)(16).It has long chain n-3 fatty acid oxidation was suppressed by rosemary extract, rosemary extract exhibited higher antioxidant activity. The ability of the rosemary extract to scavenge free radicals is three times that of DPPH (17).

- USES OF ROSEMARY EXTRACT IN COSMETICS:
  - It is used for acne.
  - It is used for anti- aging.
  - It is used for skin hydration.
  - It is used for sun protection.(18)
- EXAMPLE: Serums, Creams, Lotion, Face wash. (19)



Fig 2: Rosemary Extract (20)

## 3. NEEM EXTRACT:

- BOTANICAL NAME: *Azadirachta indica*.
- FAMILY: Maliaceae (21).

Neem as a possible natural active ingredient for topical and cosmetic product. Neem contains flavonoids and polyphenols, particularly quercetin which neutralize free radical and reduce oxidative stress. This protects the skin calls against the primary causes of skin aging, which are pollution, pollutants and UV radiation .Numerous compounds such as quercetin, azadirachtin, several limonoids and nimbosterol are found in neem (22).

➤ USES OF NEEM EXTRACT:

- Acne treatment by germs addressing skin.
- It can regulate excessive oil production.
- Anti- aging
- Moisturizing the skin.
- Skin infection. (23)

➤ EXAMPLE: Skin creams, Lotion, Soaps, Face mask. (24)



**Fig 3: Neem Extract (25)**

#### 4. ALOEVERA

- BOTANICAL NAME: *Aloe barbadensis*.
- FAMILY: Asphodelaceae.(26)

These days, the cosmetics industry uses aloe vera, a natural ingredient, extensively. The health, cosmetic, therapeutics and skin care benefits of the aloe vera plant been recognized and utilized for generation. Vitamins, Enzymes, Minerals, and Carbohydrates, Lignin, Saponins, Salicylic acid and amino acid are among the 75 potentially active ingredients found in aloe vera (27). Vitamins A, C, and E are present in good concentrations in aloe vera. These function as potent antioxidants to fight free radicals and shield the skin from the damaging effects of oxidative stress and early aging. (28)

➤ USES OF ALOEVERA

- It is used for sun production.
- It is used for UV protection.
- It is used to the skin to moisturize it.
- It is used for whitening the skin. (29)

➤ EXAMPLE: Lotion, Creams, Moisturize, Foundation, Concealer. (30)



**Fig 4: Aloe vera (31)**

#### 5. GREEN TEA EXTRACT:

- BOTANICAL NAME: *Camellia sinensis*.
- FAMILY: Theaceae. (32)

The tea plants and its extracts, along with their centuries-old use are significant players in the cosmetic industry. Cosmetics that contain tea extracts high in polyphenols generally improve the appearance of skin and reduce lipid peroxidation and skin damage after UV exposure. And it has a antioxidant properties to reduce the oxidative stress.(33)

More and more cosmetics made with tea extracts particularly those made with green tea infusion but also more lately black and white tea. The bioactive substance such as polyphenols, catechins, caffeine, polysaccharides, L-theanine and other are abundant in green tea. (34)

##### ➤ USES OF GREEN TEA EXTRACT:

- It prevents the aging of the skin.
- It can shield your skin from oxidative damage brought on by UV radiation.
- It promotes hydration of the skin.
- Green tea helps to reduce transepidermal water loss (35)

##### ➤ EXAMPLE: peeling mask, body lotion, body creams, face mask.(36)



**Fig 5: Green Tea Extract (37)**

#### 6. GRAPE SEED EXTRACT:

- BOTANICAL NAME: *Vitis vinifera*.
- FAMILY: Vitaceae. (38)

Grape seed extract is a phenolic compound can be utilized in place of synthetic one to create safe, natural goods that meet the demands of contemporary society. They have promising uses, particularly in the cosmetics industry. Grape polyphenols primary healths are associated with their antibacterial, antifungal and antioxidant capabilities. The most prevalent bioactive still present in the grape seed residues were gallic acid, catechins hydrate, and procatechuic acid; these are primarily in charge of the antioxidant activity. There are numerous products on the market that contain GSE as a primary component. (39)

##### ➤ USES OF GRAPE SEED EXTRACT:

- They can increase skin hydration and smoothness.
- It is used to skin lightening treatment.
- It is used to lessen skin redness and roughness.
- They can also shield the skin from UV rays and oxidative stress.
- It is used to reduce the hyper pigmentation. (40)

##### ➤ EXAMPLE: lotion, toners, Moisturizing, Cream, gels (41)



**Fig 6: Grape Seed Extract (42)**

## CONCLUSION

In summary, there is an increasing demand for herbal antioxidants in cosmetics. Herbal antioxidants satisfy the natural and sustainable ingredients that consumers value most. They are prominent in skincare products because they work well to treat aging and skin damage. Herbal antioxidants such as vitamin E and green tea extract are being used by cosmetic companies in their products. An important role for herbal antioxidants in the future of the cosmetics sector is indicated by the growing knowledge of their advantages.

## REFERENCES

1. Kusumawati I, Indrayanto G. Chapter 15 - Natural Antioxidants in Cosmetics [Internet]. Atta-ur-Rahman, editor. Vol. 40, Science Direct. Elsevier; 2013. p. 485–505. Available from: <https://www.sciencedirect.com/science/article/abs/pii/B9780444596031000151>
2. Mamta P, Misra K, Dhillon GS, Brar SK, Verma M. Antioxidants. Biotransformation of Waste Biomass into High Value Biochemicals. 2013 Jul 20;117–38.
3. Hoang HT, Moon JY, Lee YC. Natural Antioxidants from Plant Extracts in Skincare Cosmetics: Recent Applications, Challenges and Perspectives. Cosmetics [Internet]. 2021 Dec 1;8(4):106. Available from: <https://www.mdpi.com/2079-9284/8/4/106>.
4. Kusumawati I, Indrayanto G. Chapter 15 - Natural Antioxidants in Cosmetics [Internet]. Atta-ur-Rahman, editor. Vol. 40, ScienceDirect. Elsevier; 2013. p. 485–505. Available from: <https://www.sciencedirect.com/science/article/abs/pii/B9780444596031000151>
5. Costa R, Santos L. Delivery systems for cosmetics - From manufacturing to the skin of natural antioxidants. Powder Technology. 2017 Dec;322:402–16.
6. Flieger J, Flieger W, Baj J, Maciejewski R. Antioxidants: Classification, Natural Sources, Activity/Capacity Measurements, and Usefulness for the Synthesis of Nanoparticles. Materials. 2021 Jul 25;14(15):4135.
7. Gonçalves GMS, Silva GH da, Barros PP, Srebernick SM, Shiraishi CTC, Camargos VR de, et al. Use of Curcuma longa in cosmetics: extraction of curcuminoid pigments, development of formulations, and in vitro skin permeation studies. Brazilian Journal of Pharmaceutical Sciences [Internet]. 2014 Dec [cited 2020 Mar 6];50(4):885–93. Available from: <http://www.scielo.br/pdf/bjps/v50n4/1984-8250-bjps-50-04-00885.pdf>
8. Uchejeso Mark Obeta, Patience Leo Jaryum, Obiora Reginald Ejinaka, Utibe E. Turmeric is Medicinal and Cosmetic in Nature, the Production of Obeturmeric Powder and Cream. International Journal of Pharmaceutical and Phytopharmacological Research [Internet]. 2023 Jan 1 [cited 2024 Oct 8];13(2):18–24. Available from: [https://www.researchgate.net/publication/371682412\\_Turmeric\\_is\\_Medicinal\\_and\\_Cosmetic\\_in\\_Nature\\_the\\_Production\\_of\\_Obeturmeric\\_Powder\\_and\\_Cream](https://www.researchgate.net/publication/371682412_Turmeric_is_Medicinal_and_Cosmetic_in_Nature_the_Production_of_Obeturmeric_Powder_and_Cream)
9. Arora R, Aggarwal G, Dhingra G, Nagpal M. Herbal Active Ingredients Used In Skin Cosmetics [Internet]. ResearchGate. Innovare Academic Sciences; 2019. Available from: [https://www.researchgate.net/publication/338742749\\_HERBAL\\_ACTIVE\\_INGREDIENTS\\_USED\\_IN\\_SKIN\\_COSMETICS](https://www.researchgate.net/publication/338742749_HERBAL_ACTIVE_INGREDIENTS_USED_IN_SKIN_COSMETICS)
10. Jain D, Singh K, Gupta P, Gupta JK, Sahu PK, Dwivedi S, et al. Exploring Synergistic Benefits and Clinical Efficacy of Turmeric in Management of Inflammatory and Chronic Diseases: A Traditional Chinese Medicine Based Review. Pharmacological Research - Modern Chinese Medicine [Internet]. 2025 Jan 1;100572–2. Available from: <https://www.health.com/turmeric-and-honey-for-weight-loss-8784758>
11. Sławomir Jarzab. Cosmetics containing turmeric in the light of the results of scientific research - Aesthetic Cosmetology [Internet]. Aesthetic Cosmetology. 2023. Available from: <https://aestheticcosmetology.com/cosmetics-containing-turmeric-in-the-light-of-the-results-of-scientific-research/>
12. US7763289B2 - Topical turmeric skin care products - Google Patents [Internet]. Google.com. 2008. Available from: <https://patents.google.com/patent/US7763289B2/en>
13. Chauhan M. Turmeric, Curcumin (Curcuma longa) - Properties, Benefits & Dosage [Internet]. Planet Ayurveda. 2019 [cited 2025 Aug 1]. Available from: [https://www.planetayurveda.com/library/turmeric-curcuma-longa/?srsltid=AfmBOoqWF4IKPTdVXDyewa16Qxw8KcM7uYJjQu6DU8LVN\\_jRXcRceUbJ](https://www.planetayurveda.com/library/turmeric-curcuma-longa/?srsltid=AfmBOoqWF4IKPTdVXDyewa16Qxw8KcM7uYJjQu6DU8LVN_jRXcRceUbJ)

14. Macedo LM, dos Santos ÉM, Militão L, Tundisi LL, Ataíde JA, Souto EB, et al. Rosemary (*Rosmarinus officinalis* L., syn *Salvia rosmarinus* Spenn.) and Its Topical Applications: A Review. *Plants* [Internet]. 2020 May 21;9(5). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7284349/>
15. Sahlabgi A, Lupuliasa D, Stanciu G, Luþsor S, Vlaia LL, Rotariu R, et al. The Development and Comparative Evaluation of Rosemary Hydroalcoholic Macerate-Based Dermatocosmetic Preparations: A Study on Antioxidant, Antimicrobial, and Anti-Inflammatory Properties. *Gels* [Internet]. 2025 Feb 20 [cited 2025 Apr 1];11(3):149. Available from: <https://www.mdpi.com/2310-2861/11/3/149#B22-gels-11-00149>
16. González-Minero FJ, Bravo-Díaz L, Ayala-Gómez A. *Rosmarinus officinalis* L. (Rosemary): An Ancient Plant with Uses in Personal Healthcare and Cosmetics. *Cosmetics* [Internet]. 2020 Dec 1;7(4):77. Available from: <https://www.mdpi.com/2079-9284/7/4/77/htm>
17. Embuscado ME. Spices and herbs: Natural sources of antioxidants – a mini review. *Journal of Functional Foods*. 2015 Oct;18:811–9.
18. Neha Sawarkar. Rosemary Extract in Cosmetics and Personal Care Products [Internet]. Periodical by Knowde. 2023. Available from: <https://periodical.knowde.com/rosemary-extract-in-cosmetics-and-personal-care-products/>
19. Neha Sawarkar. Rosemary Extract in Cosmetics and Personal Care Products [Internet]. Periodical by Knowde. 2023. Available from: <https://periodical.knowde.com/rosemary-extract-in-cosmetics-and-personal-care-products/>
20. Hardy B. *Dickens and Creativity*. Continuum; 2008.
21. AR, Freire TB, Marques G de A, Rijo P, Lima FV, Carvalho JCM de, et al. *Azadirachta indica* (Neem) as a Potential Natural Active for Dermocosmetic and Topical Products: A Narrative Review. *Cosmetics*. 2022 Jun 2;9(3):58.
22. Kadam O, Bais S. Review on: A Potential Natural Component for A Topical and Dermo cosmetic Products: *Azadirachta Indica*. *International Journal of Pharmacy and Herbal Technology* [Internet]. 2025 [cited 2025 Aug 2];3:3797. Available from: <https://ijprdjournal.com/myapp/uploads/450-ONKARESHWAR%20KADAM%20%20%20%203797-3810.pdf>
23. Prabhashankar M. Impact of Yoga and Meditation on Health. *International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)* [Internet]. 2020;11(1):2581. Available from: <http://ijarsct.co.in/Paper630.pdf>
24. 24.Neem Kosmetik zur Haut- und Haarpflege Niem-Handel [Internet]. Niem-Handel. 2025 [cited 2025 Aug 2]. Available from: <https://niem-handel.de/en/usefull-information/all-about-neem/cosmetic-applications-of-neem/>
25. Neem *Azadirachta Indica* Liquid Extract [Internet]. *indiamart.com*. 2021 [cited 2025 Aug 2]. Available from: <https://m.indiamart.com/proddetail/neem-azadirachta-indica-liquid-extract-20493932062.html?srsId=AfmBOorTOVZLUgtU8WaRjQFUZ6PrW1x8SrPNyBTeyFCHNiaA-WOet2A7>
26. Nagrik SU, None Shivshankar M, Chharre VS, Dhage SM, Borey VS. Role of aloe vera in skincare: exploring its therapeutic benefits, formulations, and future innovations. *Yemen Journal of Medicine*. 2024 Dec 13;3(3):197–206.
27. Surjushe A, Vasani R, Saple D. Aloe vera: A short review. *Indian Journal of Dermatology* [Internet]. 2008;53(4):163. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2763764/>
28. Nagrik SU, None Shivshankar M, Chharre VS, Dhage SM, Borey VS. Role of aloe vera in skincare: exploring its therapeutic benefits, formulations, and future innovations. *Yemen Journal of Medicine*. 2024 Dec 13;3(3):197–206.
29. Zhu J, Zheng Y, Ge Y. Study on the application of Aloe vera in cosmetology and clinical treatment of skin diseases. *Journal of Holistic Integrative Pharmacy* [Internet]. 2024 Dec 18;5(4):299–304. Available from: [https://www.sciencedirect.com/science/article/pii/S2707368824000633?fbclid=IwZXh0bgNhZW0CMTEAAR0nN0nQXIjIp71DL6jVOWoYuQpJDIWfbCL7xlfTR-GaCPAkSz5WyZydj0\\_aem\\_r8wOh5ZC8FmBwN12YkalYQ](https://www.sciencedirect.com/science/article/pii/S2707368824000633?fbclid=IwZXh0bgNhZW0CMTEAAR0nN0nQXIjIp71DL6jVOWoYuQpJDIWfbCL7xlfTR-GaCPAkSz5WyZydj0_aem_r8wOh5ZC8FmBwN12YkalYQ)
30. Aloe *Barbadensis* (aloe vera) Extract: Cosmetic Ingredient INCI [Internet]. *Specialchem.com*. 2023 [cited 2025 Aug 2]. Available from: <https://www.specialchem.com/cosmetics/inci-ingredients/aloe-barbadensis-extract>.
31. Benefits and Dangers of Aloe Vera [Internet]. *News-Medical.net*. 2018. Available from: <https://www.news-medical.net/health/Health-Benefits-and-Dangers-of-Aloe-Vera.aspx>
32. Mahmood T, Akhtar N. Stability of a Cosmetic Multiple Emulsion Loaded with Green Tea Extract. *The Scientific World Journal*. 2013;2013:1–7.
33. Koch W, Zagórska J, Marzec Z, Kukula-Koch W. Applications of Tea (*Camellia sinensis*) and its Active Constituents in Cosmetics. *Molecules* [Internet]. 2019 Nov 24;24(23):4277. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6930595/pdf/molecules-24-04277.pdf>

34. Liao R, Parker T, Bellerose K, Vollmer D, Han X. A Green Tea Containing Skincare System Improves Skin Health and Beauty in Adults: An Exploratory Controlled Clinical Study. *Cosmetics*. 2022 Sep 12;9(5):96
35. Can Camellia Sinensis (Tea Plant) Benefit Your Skin? [Internet]. SkinKraft. Available from: <https://skinkraft.com/blogs/articles/benefits-of-camellia-sinensis-for-skin>
36. Yashwant Yashwant Site – Your SUPER-powered WP Engine Site [Internet]. impactfactor.org. Available from: <http://impactfactor.org/PDF/IJCPR/14/IJCPR>
37. Tea Extract [Internet]. Tradeindia. 2025 [cited 2025 Aug 3]. Available from: <https://www.tradeindia.com/products/green-tea-extract-c8106685.html>
38. Gupta M, Dey S, Marbaniang D, Pal P, Ray S, Mazumder B. Grape seed extract: having a potential health benefits. *Journal of Food Science and Technology* [Internet]. 2020 Apr 1;57(4):1205–15. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7054588/>
39. Salem Y, Rajha HN, Franjeh D, Hoss I, Maria Letizia Manca, Manconi M, et al. Stability and Antioxidant Activity of Hydro-Glyceric Extracts Obtained from Different Grape Seed Varieties Incorporated in Cosmetic Creams. *Antioxidants*. 2022 Jul 10;11(7):1348–8.
40. The Skin Benefits of Grape Seeds Canyon Ranch [Internet]. Canyonranch.com. 2021 [cited 2025 Aug 3]. Available from: <https://www.canyonranch.com/well-stated/post/the-skin-benefits-of-grape-seeds>.
41. Grape Seed Extract (MakingCosmetics) [Internet]. Specialchem.com. 2021 [cited 2025 Aug 3]. Available from: <https://www.specialchem.com/cosmetics/product/makingcosmetics-grape-seed-extract-makingcosmetics>
42. Grape Seed Extract Powder [Internet]. indiamart.com. 2023 [cited 2025 Aug 3]. Available from: [https://m.indiamart.com/proddetail/grape-seed-extract-powder-8842990155.html?srltid=AfmBOorJiiKhYhhNVX1rIQeXaL-uArieiXF8CrrVeX9KJcyup4etd\\_qj](https://m.indiamart.com/proddetail/grape-seed-extract-powder-8842990155.html?srltid=AfmBOorJiiKhYhhNVX1rIQeXaL-uArieiXF8CrrVeX9KJcyup4etd_qj)