
Medicinal Plants in Haryana as Potential Cosmetic Resources: A Review

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Abstract:

Considering the growing global demand for organic and eco-friendly beauty products, this review article explores the cosmetic attributes of plant species found in Haryana, India. Through extensive literature survey, the paper addresses global trends in plant-based cosmetics, the phytochemical constituents found in plants from Haryana and the interaction between traditional knowledge and current scientific insights. The research findings indicate that several plants species that are traditionally used for skin and haircare possess significant phytochemicals such as oils, alkaloids, tannins, saponins, phenols, flavonoids and, terpenoids that could be used in several cosmetic formulations. The review would be helpful to develop methods for the long-term utilisation of Haryana's botanical resources in the cosmetic industry as well as foster collaboration between researchers, local communities, and the beauty sector.

Keywords: phytochemicals, plant-based cosmetics, medicinal plants, conservation, traditional knowledge

Introduction:

According to Section 3(aaa) of the Drugs and Cosmetics Act 1940 and Rules 1945, “cosmetic” means any article intended to be rubbed, poured, sprinkled, or sprayed on, or introduced into, or otherwise applied to, the human body or any part thereof for cleansing, beautifying, promoting attractiveness, or altering the appearance and includes any article intended for use as a component of cosmetic¹.

There has been a tremendous change in the personal care and cosmetics industry in the recent years as a greater number of consumers are choosing the organic products that are not only effective but also skin friendly and environmentally friendly. Before the

development of synthetic compounds, plants were the main organic source for cosmetic products². The cosmetics industry, therefore, is now widely looking into the potential of utilising the abundant diversity of indigenous plant species for their cosmetic formulations. India has abundant floral diversity because of the diverse climatic conditions and topographical features found within different regions of the country³. India is one of the world's 17 megadiversity countries, home to 28% of endemic plant species and 11.4% of all known plant species worldwide⁴. Floral diversity of India includes ca 17000 species of flowering plants, 64 gymnosperms, 1200 pteridophytes, 2850 bryophytes, 13000 fungi and 12500 algae⁵. The country is also a rich repository for medicinal plants with significant pharmaceutical and cosmeceutical phytoconstituents. Database OSADHI has identified 21,238 medicinal plants distributed all over India, of which 6959 are indigenous. The database presently contains information on 22,314 distinct phytochemicals found in these 6959 medicinal plants⁶.

Haryana, a northern state of India, also has a rich diversity of plant species. Kumar (2001) has reported 1062 wild plant taxa falling under 583 genera representing 138 plant families from Haryana⁷. Several of these plants are significantly used in traditional herbal medicine as well as cosmetic and beauty preparations by local communities and represent a significant repository of wisdom^{8,9}. Concurrently, recent techniques, such as thin-layer chromatography (TLC), high-performance liquid chromatography (HPLC), gas chromatography (GC), Fourier transform infrared spectroscopy (FTIR), nuclear magnetic resonance (NMR) spectroscopy, and infrared spectroscopy are providing insights on the phytochemical compositions and cosmeceutical potential of these plants^{10,11}. The integration of traditional knowledge and contemporary advancements has revolutionized the beauty sector and provides a strong argument for the use of Haryana's abundant plant resources in beauty formulations.

The purpose of this study is to conduct a comprehensive analysis of the existing literature and identify areas where our knowledge of cosmetic potential of plant species of Haryana is lacking. The emphasis is on species that have gotten little attention or are poorly documented for cosmetic use. This review mainly focuses to address the following research questions:

1. What are the frequently used plant-based chemicals in the global manufacturing of herbal cosmetics, and what specific roles do they fulfil in cosmetic formulations?
2. What are the main phytochemical components of plant species found in Haryana that add to their cosmetic worth, and what are the particular advantages they offer for plant-based cosmetic products.
3. How does traditional knowledge identify and use plant species for cosmetic purposes, and how does it interact with modern science?
4. What is the distribution, documentation, and conservation status of these plant species in Haryana, India?

The aim is to integrate the findings and insights obtained from the analysis into a holistic framework that would help to outline strategies for the long-term utilisation of Haryana's botanical resources in the cosmetics industry, with a specific focus on the importance of collaboration between researchers, local communities, and the beauty sector.

Methodology

Extensive search was conducted in electronic databases, namely, PubMed, Wiley Online Library, ScienceDirect, Web of Science, and Google Scholar using keywords and their combinations, such as "plant-based cosmetics," "cosmeceuticals in beauty industry," "phytochemicals used for cosmetic production and their functions," "essential oils," "plant-based dye and colourants," "plant oils used in cosmetics," "plant-based fat and waxes for cosmetics", and variants to find academic publications, reviews, and research papers. Additionally, searches included terms related to "traditional cosmetic practices in Haryana, India", "medicinal plants of Haryana", and "the status and conservation of medicinal plants", "the status and conservation of medicinal plants", of Haryana". The literature concerning the herbal cosmetics and traditional plant usage in Haryana and India was gathered from the college and university libraries and internet archives, including books, journals, conference papers, abstracts, and reports. A thorough review was also carried out on the online platforms of herbal beauty companies and cosmetic manufacturers such as The Body Shop, Kiehl's, Aveda, Forest Essentials, Lotus, Fabindia, and Biotique. The main

objective was to ascertain the key specific materials and botanical components included in their products.

Results and Discussion

1. Major plant-based chemicals in the global manufacturing of herbal cosmetics and their roles.

Most commonly used chemical constituents of plants used in cosmetic formulations include oils, fats, waxes, essential oils, dyes, and pigments¹². These compounds serve as colouring, perfuming, moisturising, thickening and stabilizing agents in cosmetics.

1.1 Oils, fats, and waxes:

Plant-derived oils, fats, and waxes are important ingredients in skin and hair care products. They contribute significantly to the effectiveness, texture, and overall appeal of cosmetic products by providing emollient properties, acting as fragrance carriers, and offering natural sun protection¹³. Saturated fats such as stearic acid, found in shea butter produced from the nuts of the *Vitellaria paradoxa* tree and cocoa butter derived from the beans of the *Theobroma cacao* tree, add thickness and stability to the cosmetic formulation^{14,15}, while palmitic acid from palm oil improves the texture. Unsaturated fats such as oleic acid found in avocado and olive oils have emollient qualities¹⁶. Linoleic acid, present in safflower and sunflower oils, aids in skin moisture retention¹⁷. Moringa (*Moringa oleifera*), black seed (*Nigella sativa*), cocoa (*Theobroma cacao*), sesame (*Sesamum indicum*), coconut (*Cocos nucifera*) and avocado (*Persea americana*) oils have antibacterial activities and are recommended to be used in several haircare and skincare formulations¹⁸. Carnauba and candelilla waxes are plant waxes that give structure and firmness to cosmetic compositions such as lipsticks¹⁹. Carotenoids present in carrot seed oil and raspberry seed oil have potential sunscreen properties^{20,21}. Furthermore, phytosterols, tocopherol (Vitamin E), squalene, and humectants like glycerine produced from plant oils like coconut, soy, and palm contribute to skin health by supplying antioxidants, preserving moisture, and avoiding dryness. Because of their conditioning, occlusive, emollient, and

moisturising properties, oils, fats, and waxes are used as the base in a wide range of cosmetic products such as creams, lotions, emulsions, cleansing milks, ointments, hair conditioners, cosmetic masks, lipsticks, foundations, mascara, eye shadows, lip balms, bath fluids, nail varnish, and nail cleaners²². More than 25 plant derived oils including coconut oil, almond oil, palm oil, avocado oil, soy oil, sunflower oil, sesame oil, and rapeseed oil are used as carrier oils in several hair and skin care products²³.

1.2 Essential oils:

Essential oils play a crucial role in organic skin and hair care products because of their antioxidant, antibacterial, and anti-inflammatory properties as well as their ability to provide pleasant fragrances²⁴. Phytochemicals such as catechins, gallic acid, epicatechin, flavonoids, polyphenols, and terpenes present in tea tree, eucalyptus, and lavender oil have the potential to develop cosmetic formulations promoting healthy skin and scalp as they have antioxidant, antimicrobial and anti-inflammatory properties²⁵. Tea tree (*Melaleuca alternifolia*) essential oil has the potential to improve photoaged skin²⁶. Essential oils that are high in fatty acids, such as jojoba, rosehip, and argan are used in cosmetic products that lighten and brighten the skin and reduce inflammation²⁷. Oils like rosehip and helichrysum regenerate skin cells and are used in products that improve skin's elasticity and fade scars. Additionally, oils like peppermint and rosemary improve blood flow. These are added to cosmetics that give glowing skin as well as enhance hair follicle function. There are over 3000 different essential oils known today, each with its unique set of benefits²⁸. Integrating essential oils into skincare and haircare products would give a holistic and sensory-rich experience while addressing various skin and hair issues.

1.3 Dyes and pigments:

Plant-derived colourants including dyes and pigments are preferred in cosmetic industry due to their natural and usually hypoallergenic properties. They are used to impart colour to makeup, skincare, and hair care products²⁹. Betalains derived from *Hylocereus polyrhizus* and *Beta vulgaris* can be utilized in the formulation of lipsticks, lip balms and blushes to provide coloration^{30,31}. Anthocyanins present

in coloured flowers such as *Clitoria ternatea*, *Carthamus tinctorius*, and *Papaver rhoeas* possess a diverse array of red, purple, and blue hues and are attracting interest of the cosmetic industry for their prospective use in dermatology and cosmetic formulations especially makeup products such as lipsticks, eyeshadows, and blushes³². Chlorophyll can be used in the formulation of makeup products such as eyeshadows because of its high green pigmentation³³. Phycocyanin pigment obtained from *Spirulina platensis*, yields blue and green colours which can serve as a key component in the formulation of organic hair dyes, lipstick, eye makeup, and mascara^{34,35}. Carotenoid pigments produced by the vibrant orange seeds of *Bixa orellana* and *Daucus carota* root can be utilised in formulating lipsticks, blushes, and eyeshadows^{36,37}. Naphthoquinone chemicals, alkannin and shikonin present in the roots of *Alkanna tinctoria* yield red pigment that could be utilised in formulation of herbal lipsticks³⁸. Several other plant-derived colourants enrich cosmetics by providing a wide palette while meeting the increasing need for natural and sustainable components in beauty formulas.

2. Phytochemical components of plant species of Haryana, their cosmetic potential and traditional usage (Table 1)

3. Current status of distribution, documentation, and conservation of medicinal plants of Haryana.

Several medicinal plants in the state are on the verge of extinction due to urbanization, overexploitation, deforestation, and climate change³⁹. The State Medicinal Plants Board was established in 2002 for survey, documentation, and conservation of medicinal plants found in Haryana. More than 50 herbal parks and nurseries have been established all over the state that serve as repositories of diverse plant species and provide a steady supply of quality planting material for reforestation and community-based afforestation projects. However, there are only few ethnomedical research studies in Haryana with majority of them concentrated in only 10 of the state's 22 districts⁴⁰. Three fourth of the state still remains to be explored for ethnomedicinal usage. None of the studies focused on the potential of plant diversity of Haryana in hair and skin products. There are several sacred groves managed by local communities in the state for conservation of medicinal plants, but they are not

well protected and face threats from developmental projects, urbanization, and population explosion. Moreover, few studies have documented the existence and role of these sacred groves in conservation medicinal plants⁴¹.

Conclusion

For thousands of years humans have used plant parts and their extracts not only to treat skin and hair related problems but also as cosmetics to enhance the physical appearance. Plants possess several phytochemicals that have antimicrobial, anti-inflammatory, antioxidant, moisturizing, emollient, and fragrance attributes. Being natural, non-toxic, and environmentally sustainable these bioactive compounds are now widely being utilized in cosmetic formulations of makeup products, body and hair oils, perfumes, anti-ageing and skin lightening lotions and creams, and sunscreens. Literature survey of 43 plant species with their associated phytochemicals indicates that Haryana has a rich repository of medicinal plants that possess prominent phytochemicals with cosmetic potential. However, there is a significant gap in ethnomedicinal research especially regarding the cosmetic utilization of plant species found in Haryana as the major portion of the state remains unexplored from an ethnomedicinal perspective. Traditional ethnomedicinal knowledge is gradually vanishing. There is the need for further exploration and documentation of traditional medicinal usage of plants in hair and skincare. The integration of this traditional wisdom with physico-chemical analyses could lead to innovative developments in the cosmetic industry. Along with this growing interest, there is an urgent need for the appropriate and sustainable utilisation of resources. In order to preserve the long-term viability of these important resources, it is imperative to address conservation concerns, including but not limited to habitat degradation, over-harvesting, and loss of biodiversity.

TABLE 1: PHYTOCHEMICAL COMPONENTS OF PLANT SPECIES FOUND IN HARYANA, THEIR COSMETIC POTENTIAL AND TRADITIONAL USE

S.N.	Botanical Name	Common Name	Phytochemicals with Cosmetic Value	Mode of Action	Traditional use in skin and hair care
1.	<i>Aegle marmelos</i> ^{42, 43}	Bael	carotenoids, phenolics, alkaloids, pectins, tannins, coumarins, flavonoids, and terpenoids	antibacterial, antifungal, antioxidant, anti-inflammatory,	leaf extract is used in skin infections, crases, and itchy skin
2.	<i>Abrus precatorius</i> ^{44, 45, 46}	Ratti	glycoprotein abrin, abruquinones, flavonoids, phenolics, terpenoids, steroids, alkaloids, organic acids, esters, proteins, polysaccharides	antibacterial, antioxidant, anti-inflammatory, hair growth properties	promotes hair growth, treats alopecia
3.	<i>Abutilon indicum</i> ^{47,48,49}	Kanghi	carbohydrates, alkaloids, starch, glycosides, flavonoids, and phenol	antioxidant, anti-inflammatory, and antibacterial	Leaves are used in mouthwash and wound healing
4.	<i>Acacia nilotica</i> ^{50,51, 52,53,54}	Babool	tannins, flavonoids, alkaloids, fatty acids, and polysaccharides (gums)	antioxidant, anti-inflammatory, antibacterial, antifungal, anti-melanin	gum with white of egg is applied to burns and scalds, paste of burnt leaves is effective ointment for the itch, used as a gargle in spongy gums
5.	<i>Achyranthes aspera</i> ^{55,56,58,58,65}	Kutri	flavonoids, tannins, terpenoids, saponins, phytosterols, phenolics	wound healing, anti-inflammatory, itches, skin eruptions, and antioxidant	Juice of the plant is used in the treatment of boils, skin eruptions and itching.
6.	<i>Ageratum conyzoides</i> ^{59, 60,61, 65}	Visadodi	flavonoids, alkaloids, chromene, terpenoids, coumarins, and sterols	wound healing, antimicrobial, anti-inflammatory, antioxidant, antifungal	Plant juice is employed for wound healing, skin ulcers. Leaves are used to cure cut and wounds. Leaf paste is applied externally to cure scabies.
7.	<i>Adhatoda vasica</i> ^{62,63,64,65}	Adusa	alkaloids such as adhatodine, vasicine, vasicinone, vasicinolone, vasicol, vasicoline, vasicolinone, and silicic acid	collagen synthesis, skin, hair and nails health antioxidant, anti-inflammatory, antimicrobial	fresh leaves juice / extract is used for skin affection and control of scabies
8.	<i>Albizia lebbek</i> ^{66,67,68}	Siris	saponins, triterpenoids, flavonoids, alkaloids, phenolic glycosides	antioxidant, anti-inflammatory, antimicrobial, hair follicle strengthening, hair growth	Stem and root bark extracts are used as soap and hair cleansers.

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				promotion	
9.	<i>Amaranthus viridis</i> 69,70		unsaturated fatty acids, tocopherols, phytosterols, and squalene	anti-inflammatory, antimicrobial moisturizing, antioxidant, skin nourishing, and sun protection	oil is used in body massages, baths, and relaxation treatments.
10.	<i>Allium sativum</i> 71,72,73,74	Garlic	flavonoids, sulphur-containing compounds, vitamins A, C, E, B1, B2, and niacin, phenols, terpenoids, and alkaloids.	antioxidant, anti-inflammatory, antibacterial and antifungal, promotes healthy hair and skin	extract obtained from bulb is used in hair loss problems and acne treatment
11.	<i>Aloe vera</i> ^{75,76}	Ghrit Kumari	alkaloids, terpenoids, carbohydrates, flavonoids, tannins, anthraquinones, saponins, hexanoic acid, citronellyl butyrate, phytol, myristic acid, palmitic acid, palmitoyl chloride, and octadecanal	antibacterial, antifungal, antiseptic, anti-inflammatory, cooling and soothing agent, moisturizer and nourishing product for hair and skin	used as hydrating agent in skin and hair care
12.	<i>Anacyclus pyrethrum</i> 64,77, 78, 79	Akarkara	flavonoids and phenolics	antioxidant, skin nourishing, and sun protection, anti-inflammatory	root extract is used in toothache, pyorrhoea, vitiligo, and skin disorders
13.	<i>Andrographis paniculate</i> ^{80,81}	Kalmegh	diterpene labdanes deoxyandrographolide, andrographolide, 14-deoxy-11,12-didehydroandrographolide, and neoandrographolide diterpene glucoside.	antioxidant, anti-inflammatory, antimicrobial	leaves are crushed with turmeric and applied externally to cure Itches and skin infection
14.	<i>Bauhinia variegata</i> 82, 83	Kachnar	alkaloids, flavonoids, carbohydrates, proteins, and phenolic compounds such as lupeol, kaempferol, β -sitosterol, quercetin, rutin, and epigenin	antioxidant	leaves and bark used in skin infections
15.	<i>Boerhaavia diffusa</i> 84,85,86,87	Punarnava	steroids, triterpenoids, alkaloids such as punarnavine, flavonoids, lipids, lignin, proteins, carbohydrates, and glycoproteins	astringent, antimicrobial, antioxidant, antifungal	Root paste is used in skin problems, leaf extract is used in hair oil to prevent premature greying hair
16.	<i>Butea monosperma</i> 64, 88, 89	Palash	flavonoids, alkaloids, terpenoids, proteins, lipids, and sterols	antimicrobial, antioxidant, antifungal	paste of powdered seeds and lemon juice is applied to enhance the skin glow, plant juice used to cure ringworm and leprosy.
17.	<i>Calotropis procera</i> 90,91	Aak	flavonoids, triterpenes, alkaloids, steroids, saponins, proteins and enzymes	anti-inflammatory, antioxidant, antimicrobial,	skin infections, boils, and scabies.

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				antifungal	
18.	<i>Carica papaya</i> ^{92,93}	Papita	alkaloids, tannins, phenolics, flavonoids, saponins, terpenoids, sugars, glycosides, amino acids, steroids, and papain	anti-inflammatory, antioxidant, antimicrobial	latex used to treat dermatitis and psoriasis. Ripe fruit is used to treat skin ulcers.
19.	<i>Capparis decidua</i> ^{94,95}	Teend	alkaloids, terpenoids, glycosides, and fatty acids	anti-inflammatory, antioxidant, antimicrobial, antifungal	young leaves are applied as plaster on boils and swellings.
20.	<i>Convolvulus arvensis</i> ^{96,97}	Hirankhuri	flavonoids, steroids, terpenoids, carbohydrates, amino acids, anthocyanidins, phenylpropanoids, coumarins, lignans, resins, tannins, saponins, alkaloids, lipids, and fatty acids	anti-inflammatory, antioxidant, antimicrobial, antifungal	paste of young leaves/shoot tips applied in skin allergies
21.	<i>Centella asiatica</i> ^{98,99,100,101}	Brahmi booti	triterpenoids, flavonoids, and phenolic acids	antioxidant, anti-collagenase, anti-elastase	plant decoction is used in leprosy, used with oil to strengthen hair follicles.
22.	<i>Cestrum nocturnum</i> ^{102,103}	Raat ki rani	saponins, flavonoids, alkaloids, phenolics, glycosides, fatty acids, coumarins	anti-inflammatory, antioxidant, antimicrobial, perfumery	Leaf paste is used to treat skin diseases
23.	<i>Clitoria ternatea</i> ^{104,105,106}	Aprajita	Anthocyanins-ternatins, phenolics, flavonoids	antioxidant, antibacterial and anti-inflammatory	root extract is used in skin disorders
24.	<i>Cuscuta reflexa</i> ^{107,108}	Dodder	flavonoids, alkaloids, lignans, saponins, phenolics, tannins, and fatty acids	skin lightening, antioxidant, antibacterial, anti-inflammatory, hair growth promoting	juice and decoction is used in skin diseases and itching. Paste from the whole plants is applied externally over cracked heels
25.	<i>Datura metel</i> ^{109,110}	Hindu Dhatura	alkaloids, terpenoids, and saturated fatty acids, coumarins, steroids, flavonoids	antioxidant, anti-inflammatory, antibacterial, and collagen synthesis	leaves are used in infectious skin and cutaneous lesions, abscesses, chronic wounds
26.	<i>Eclipta alba</i> ^{111,112,145}	Bhangra	coumestans, triterpenoid saponins, flavonoids, alkaloids, and a glucoside of a triterpenic acid	anti-dandruff activity, antifungal, antioxidant	leaf extract is used treat dandruff and dermatitis
27.	<i>Emblica officinalis</i> ^{113,114}	Amla	phenolics, amino acids, tannins, alkaloids, and carbohydrates	antioxidant, anti-tyrosinase, anti-melanogenesis, anti-collagenase and anti-elastase, hair growth promotion	dry leaves are powdered and mixed in oil to promote hair growth.

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28.	<i>Euphorbia hirta</i> ^{115, 116}	Badi dhoodhi	alkaloids, anthocyanins, anthracene glycosides, carotenoids, coumarins, flavonoids, saponins, steroids/triterpenoids, tannins, and volatile oils	antibacterial, antifungal, antioxidant, wound healing, anti-inflammation	latex is applied on warts and skin problems
29.	<i>Hibiscus rosa sinensis</i> ^{117, 118, 145}	China rose	phenolic compounds such as chlorogenic, p-coumaric, and trans-ferulic acids derivatives and flavonoid derivatives	anti-inflammatory, antimicrobial, and antioxidant, anti-aging, sun protection	flower and leaf extracts are used in skin disorders and burns
30.	<i>Lawsonia inermis</i> ^{119, 120}	Mehandi	sterols, flavonoids, triterpenes, alkaloids, glycosides, tannins, proteins, carbohydrates	antibacterial, antifungal, antioxidant, and anti-inflammatory	Leaf paste is applied to get relief from skin diseases and burning sensation
31.	<i>Lantana camara</i> ^{121, 122}	Nilgiri	alcohols, carboxylic acids, phenols, alkanes, ketones, triterpenoids	antibacterial, antiacne, collagen synthesis, wound healing, source of colorant	root extract is applied to treat rash
32.	<i>Mangifera indica</i> ^{123,124}	Aam	flavonoids, xanthonoids, phenolic acids, and triterpenoids	anti-collagenase, anti-elastase, anti-hyaluronidase, anti-tyrosinase, and antioxidant	mango butter from seeds is used as moisturizer
33.	<i>Murraya paniculata</i> ^{125, 126, 127}	Kamini	phenols, coumarins, terpenoids, flavonoids, and alkaloids	anti-collagenase, antioxidant, antibacterial	fragrant flowers are used in perfumery
34.	<i>Murraya koenigii</i> ^{128, 129}	Curry patta	glycosides, alkaloids, phenolic compounds, steroids, saponins, flavonoids,	antibacterial, anti-hair-fall, antifungal, antiaging particularly suited for elasticity-boosting and anti-sagging	oil infused with curry leaves used to stimulate hair growth and stop premature greying.
35.	<i>Nyctanthes arbor-tristis</i> ^{130, 131}	Harsingar	diterpenoid, nyctanthin, flavonoids, anthocyanins, tannin, carotenoid, glycosides, and an essential oil	antioxidant, antibacterial, natural colorant	flower juice is used as a hair tonic in preventing greying of hair and baldness
36.	<i>Nelumbo nucifera</i> ^{132, 133}	Indian lotus	flavonoids, terpenoids, tannins and polyphenols.	anti-aging, antioxidant, anti-inflammatory, astringent properties	stem and flowers are used in skin diseases
37.	<i>Oryza sativa</i> ^{134, 135, 136, 137}	Chaval	phenolic compounds such as phytic acid, catechin, o-coumaric acid, epigallocatechin gallate, ferulic acid, and quercetin, anthocyanins, and saturated and unsaturated fatty acids	natural melanogenesis inhibitor and antioxidant, collagen booster, anti-ageing, anti-inflammatory, sun protection	rice bran oil and rice water are used for their nourishing and hydrating properties. The powdered rice extract is applied on the face, to obtain smooth and clear skin complexion
38.	<i>Pongamia pinnata</i> ^{64.}	Karanj	alkaloids, proteins, glycosides.	anti-inflammatory	powdered

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	¹³⁸			activity, antioxidant	form of seeds are used in chronic skin infections
39.	<i>Psidium guajava</i> ^{62, 139}	Amrood	carotenoids, flavonoids, phenolics, terpenoids, and triterpenes	antioxidant, anti-inflammatory, antimicrobial, sun protection	decoction of the bark and leaves is also reported to be used as a bath to treat skin ailments.
40.	<i>Plumbago zeylanica</i> ^{140, 141}	Chitrak	fatty acids, phenolics, flavonoids, coumarins, alkaloids, steroids, terpenoids, glycosides	antimicrobial, antioxidant, wound healing, antifungal	leaves and root are used in skin diseases.
41.	<i>Ricinus communis</i> ^{54, 142}	Arandi	glycerides of isoricinoleic acid, ricinoleic, dihydroxy-stearic acid, stearic acid, eicosanoic acid, linolenic acid, palmitic, and linolenic acid	promotes hair growth, antioxidant, anti-bacterial, anti-dandruff and anti-fungal	used as hair oil to promote hair growth
42.	<i>Senna occidentalis</i> ^{143, 144}	Kasondi	alkaloids, flavonoids, betaxanthin, coumarins, resin, steroids, terpenoids and tannins	antimicrobial, anti-inflammatory, antioxidant	leaf paste is used in skin problems.
43.	<i>Trigonella-foenum graecum</i> ^{145, 146, 147}	Methi	flavonoids, alkaloids, saponins, carbohydrates, phenols, and proteins.	promotes hair growth, antioxidant, anti-bacterial, anti-dandruff and anti-fungal	Used with cold pressed coconut oil for hair growth.
44.	<i>Withania somnifera</i> ^{148, 149, 150}	Ashwagandha	alkaloids, phenols, and flavonoids triterpene lactones, steroidal lactones, withanolides, and withaferin	anti-inflammatory, antioxidant, antimicrobial, anti-melanogenic, skin hydration, and skin elasticity	root paste is used for wound healing and to treat acne.

References

1. <https://cdsco.gov.in/opencms/opencms/en/Acts-and-rules/Drugs-and-Cosmetics-Act/>
2. McMullen, Roger L., and Giorgio Dell'Acqua. "History of Natural Ingredients in Cosmetics" *Cosmetics* 2023; 10 (3): 71. <https://doi.org/10.3390/cosmetics10030071>
3. Singh, P. Floristic Diversity of India: An Overview. In: Dar, G., Khuroo, A. (eds) Biodiversity of the Himalaya: Jammu and Kashmir State. *Topics in Biodiversity and Conservation*, 2020; 18. Springer, Singapore. https://doi.org/10.1007/978-981-32-9174-4_3
4. Anil Sharma, *et.al.* Variation in Species Composition, Structural Diversity, and Regeneration Along Disturbances in Tropical Dry Forest of Northern

-
- India, *Journal of Asia-Pacific Biodiversity*, 2023;(16):1 83-95,ISSN 2287-884X. <https://doi.org/10.1016/j.japb.2022.11.004>.
5. Hajra, P.K. and Mudgal, V. Plant diversity hotspots in India- Plant Diversity Hotspots in India: An Overview. Botanical Survey of India, Ministry of Environment & Forests, Calcutta 1997.
 6. Kiewhuo, K *et.al.* (2023). OSADHI–An online structural and analytics based database for herbs of India. *Computational Biology and Chemistry*, 102, p.107799.
 7. Kumar, S. (2001). Flora of Haryana (Materials). Bishen Singh Mahendra Pal Singh, Dehradun, Uttrakhand, India. 507pp.
 8. Wagh, V. V., & Jain, A. K. (2020). Ethnopharmacological survey of plants used by the Bhil and Bhilala ethnic community in dermatological disorders in Western Madhya Pradesh, India. *Journal of Herbal Medicine*, 19, 100234. <https://doi.org/10.1016/j.hermed.2018.09.005>
 9. Sanjay, Y., *et.al.* (2009). Plants of Haryana useful in dermatological disorders: an Ethnobotanical Survey. *Pharmacognosy Reviews*, 3(5), 94-97.
 10. Altemimi, Ammar, *et.al.*. (2017). "Phytochemicals: Extraction, Isolation, and Identification of Bioactive Compounds from Plant Extracts" *Plants* 6, no. 4: 42. <https://doi.org/10.3390/plants6040042>
 11. Kashyap, A.K., *et.al.* (2022). Technological Advancements for the Analysis of Phytochemical Diversity in Plants. In: Swamy, M.K., Kumar, A. (eds) *Phytochemical Genomics*. Springer, Singapore. https://doi.org/10.1007/978-981-19-5779-6_5
 12. Desam, N.R., Al-Rajab, A.J. (2021). The Importance of Natural Products in Cosmetics. In: Pal, D., Nayak, A.K. (eds) *Bioactive Natural Products for Pharmaceutical Applications*. *Advanced Structured Materials*, vol 140. Springer, Cham. https://doi.org/10.1007/978-3-030-54027-2_19
 13. Ahmad, A., Ahsan, H. (2020). Lipid-based formulations in cosmeceuticals and biopharmaceuticals. *biomed dermatol* 4, 12 (2020). <https://doi.org/10.1186/s41702-020-00062-9>
-

14. Ofoegbu-Chibuzo, N. E., *et.al.* (2022). Physicochemical Analysis and Fatty Acid Content of Chemical and Traditional Extracts of Shea Kernel (*Vitellaria paradoxa*) from Kwara State Nigeria. *Open Access Library Journal*, 9(1), 1-11.
15. Singh, M., *et.al.* (2020). Benefits of *Theobroma cacao* and Its Phytochemicals as Cosmeceuticals. In: Swamy, M. (eds) *Plant-derived Bioactives*. Springer, Singapore. https://doi.org/10.1007/978-981-15-1761-7_21
16. Flores, M., *et.al.* (2019). Avocado Oil: Characteristics, Properties, and Applications. *Molecules* (Basel, Switzerland), 24(11), 2172. <https://doi.org/10.3390/molecules24112172>
17. Moore, E. M., *et.al.* (2020). The Enigma of Bioactivity and Toxicity of Botanical Oils for Skin Care. *Frontiers in Pharmacology*, 11, 482611. <https://doi.org/10.3389/fphar.2020.00785>
18. Tseno Tchuenkam *et.al.* (2022). Chemical and Antibacterial Properties of Lipids Extracted from Some Plant Seeds and Fruits Commonly Used in Cosmetics. *American Journal of Food Science and Technology*, vol. 10, no. 1: 10-19. doi: 10.12691/ajfst-10-1-2.
19. de Clermont-Gallerande, *et.al.* (2022). Substitution of synthetic waxes by plant-based waxes in lipsticks. *OCL*, 29, p.19. Published by EDP Sciences, <https://doi.org/10.1051/ocl/2022010>
20. Ispiryanyan, Audronè *et.al.* (2021). Red Raspberry (*Rubus idaeus* L.) Seed Oil: A Review. *Plants*. 10. 944. 10.3390/plants10050944.
21. Arianto, A., *et.al.* (2022). The Use of Carrot Seed Oil (*Daucus carota* L.) to Formulate Nanoemulsions as an Effective Natural Sunscreen and Skin Anti-Aging. *Int J App Pharm*, Vol 14, Issue 1, 2022, 124-129
22. Bonté, J. C. A. (2021). Vegetable fats in cosmeticology. *Revista boliviana de química*, 38(2), 80-94.
23. Lin, T. K., Zhong, L., & Santiago, J. L. (2017). Anti-Inflammatory and Skin Barrier Repair Effects of Topical Application of Some Plant Oils. *International journal of molecular sciences*, 19(1), 70. <https://doi.org/10.3390/ijms19010070>

24. Guzmán E, Lucia A. (2021). Essential Oils and Their Individual Components in Cosmetic Products. *Cosmetics*. 8(4):114. <https://doi.org/10.3390/cosmetics8040114>
25. Cunha, C., *et.al.* (2022). Essential oils used in dermocosmetics: Review about its biological activities. *Journal of Cosmetic Dermatology*, 21(2), 513-529.
26. Hugo Infante, V., *et.al.* (2023). Cosmetic Formulations with *Melaleuca alternifolia* Essential Oil for the Improvement of Photoaged Skin: A Double-Blind, Randomized, Placebo-Controlled Clinical Study. *Photochemistry and Photobiology*, 99(1), 176-183.
27. Thawabteh, A. M., *et.al.* (2023). Skin Pigmentation Types, Causes and Treatment—A Review. *Molecules*, 28(12), 4839.
28. Nadeeshani Dilhara Gamage, *et.al.* (2022). Global perspective of plant-based cosmetic industry and possible contribution of Sri Lanka to the development of herbal cosmetics. *Evidence-Based Complementary and Alternative Medicine*, 2022.
29. Shahid Adeel, *et.al.* (2024). Chapter 15 - Evolving role of plant pigments in the cosmetic industry, Editor(s): Shahid Ul Islam, *Renewable Dyes and Pigments*, Elsevier, 2024, Pages 307-319, ISBN 9780443152139, <https://doi.org/10.1016/B978-0-443-15213-9.00014-4>.
30. Brudzyńska P, *et.al.* (2021) M. Plant-Derived Colorants for Food, Cosmetic and Textile Industries: A Review. *Materials*. 14(13):3484. <https://doi.org/10.3390/ma14133484>
31. Azwanida, N. N., *et.al.* (2014). Utilization and evaluation of betalain pigment from red dragon fruit (*Hylocereus polyrhizus*) as a natural colorant for lipstick. *Jurnal Teknologi*, 69(6), 139-142.
32. Sari, Suci *et.al.* (2021). Formulation of Blush Preparations by Using Natural Coloring from Red Beetroot Extract (*Beta vulgaris* L.). *Indonesian Journal of Chemistry*. 21. 860. 10.22146/ijc.60414.
33. Morocho-Jácome, A. L., *et.al.* (2020). (Bio) Technological aspects of microalgae pigments for cosmetics. *Applied Microbiology and Biotechnology*, 104, 9513-9522.

34. Kraseasintra, O., *et.al.* (2022). Application of phycocyanin from *Arthrospira (Spirulina) platensis* as a hair dye. *Frontiers in Marine Science*, 9, 1024988.
35. Ragusa, I., *et.al.* (2021). *Spirulina* for Skin Care: A Bright Blue Future. *Cosmetics.*; 8(1):7. <https://doi.org/10.3390/cosmetics8010007>
36. Indriana, M., & Salman, S. (2021). The use of kesumba (*Bixa orellana* L.) Fruit extract as lipstick colors. *Journal of Pharmaceutical And Sciences*, 4(2), 74-80. <https://doi.org/10.36490/journal-jps.com.v4i2.76>
37. Verma S., *et.al.* (2017). Formulation and Evaluation of Natural Lipsticks Prepared from *Bixa Orellana* Seeds and *Daucus Carota* Root Extract and their Comparative Study. *J. Pharm Sci Bioscientific Res.* 2017. 7(1):131-135
38. Pavithra, Thottlaganahalli *et.al.*. (2022). Formulation and Evaluation of Herbal Lipstick Containing Alkanet Root as a Natural Colorant. *Revista de Chimie.* 73. 36-40. 10.37358/RC.22.4.8545.
39. Ravikanth, G., *et.al.* (2018). Recovery of critically endangered plant species in India: need for a comprehensive approach. *Current Science*, 114(3), 504–511. <http://www.jstor.org/stable/26495103> (for loss of medicinal plants)
40. Chaudhary, Akshay & Devashree, Yumnam. (2022). Some Less Known Medicinal Plants of Haryana. *Journal of Natural Remedies.* 563-579. 10.18311/jnr/2022/28958.
41. Yadav, S., *et.al.* (2010). Sacred groves in conservation of plant biodiversity in Mahendergarh district of Haryana.
42. Monika S, *et.al.* (2023). Phytochemical, and biological review of *Aegle marmelos* Linn. *Future Sci OA.* 2023 Mar 23;9(3): FSO849. doi: 10.2144/fsoa-2022-0068. PMID: 37026028; PMCID: PMC10072075.
43. Pandey, A. and Pande, P. (2023). Evaluation of phytochemicals, anti-inflammatory and antioxidant potential of *Aegle Marmelos* l. leaves. *Advances in Pharmacology and Pharmacy*, 11(1), 66-77. <https://doi.org/10.13189/app.2023.110107>
44. Singh, V., *et.al.* (2013). Phytochemical investigation and characterization of abrin protein with gel electrophoresis from seeds of *Abrus precatorius*.

45. Omhare, N., *et.al.* (2019). Evaluation of hair growth promoting activity of petroleum ether extract of *Abrus precatorius* Linn. on Wistar Albino rats. *Journal of Drug Delivery and Therapeutics*, 9(2), 330-335. <https://doi.org/10.22270/jddt.v9i2.2426>
46. Huiqin Qian, *et.al.* (2022). The traditional uses, phytochemistry and pharmacology of *Abrus precatorius* L.: A comprehensive review. *Journal of Ethnopharmacology*, Volume 296,115463, ISSN 0378-8741, <https://doi.org/10.1016/j.jep.2022.115463>.
47. Saonere, J. A., *et.al.* (2021). Herbal bioactives: a new perspective in skin care formulation. *World Journal of Pharmaceutical Research* Vol 10, Issue 5, 2021.
48. S, Rajeshwari. (2016). Medicinal properties of *Abutilon Indicum*. *Open Journal of Plant Science*. 3. 022-025. 10.17352/ojps.000011.
49. Bolleddu, R., *et.al.* (2021). Pharmacognostical and phytochemical studies of Atibala (*Abutilon indicum* [Linn.] sweet) fruit. *Ayu*, 42(3), 138–142. https://doi.org/10.4103/ayu.AYU_264_20
50. Jame, Rasha. (2019). Phytochemical and Pharmacological Uses of *Acacia nilotica* -A Review. *International Journal of Biological Chemistry*. 6-10. 10.11648/j.ijbc.20180302.11.
51. Mansi, Srivastva *et.al.* (2021). Phytochemical composition of different plant parts of *Acacia nilotica* (L.) and their medicinal values. *Research Journal of Chemistry and Environment*. 25. 183. 10.25303/257rjce18321.
52. Mohlakoana, Mpho & Moteetee, Annah. (2021). Southern African Soap Plants and Screening of Selected Phytochemicals and Quantitative Analysis of Saponin Content. *Resources*. 10. 96. 10.3390/resources10100096.
53. Saheed, Y. (2021). Antifungal Potential of silver nanoparticles from *Acacia nilotica* Pod against Dermatophytes. *Journal of Drug Delivery and Therapeutics*, 11(5-S), 85-95. <https://doi.org/10.22270/jddt.v11i5-S.5024>
54. Bhayana, T., & Gupta, S. (2023) Elucidating the antifungal activity and mechanism of action of bioactive phytochemicals against fungal dermatitis

-
- isolates. *Arch Dermatol Res* 315, 1129–1141 (2023).
<https://doi.org/10.1007/s00403-022-02475-4>
55. Ghimire, K., *et.al.* (2015). Phytochemical constituents and pharmacological uses of medicinal plant *Achyranthes aspera*: A Review. *World Journal of Pharmaceutical Research*, 4(1), 470-489.
56. Raju, Senthil Kumar *et. al.* (2022). A comprehensive review on phytochemistry of *Achyranthes aspera* Linn.: An Indian medicinal plant. *World Journal of Advanced Research and Reviews*. 14. 57-067. 10.30574/wjarr.2022.14.2.0402.
57. Ambreen, M., & Mirza, S. A. (2020). Evaluation of anti-inflammatory and wound healing potential of tannins isolated from leaf callus cultures of *Achyranthes aspera* and *Ocimum basilicum*. *Pakistan Journal of Pharmaceutical Sciences*, 33.
58. Pakhale, S., *et.al.* (2023). Apamarga (*Achyranthes aspera*), A lord of all plants. *Research Journal of Pharmacognosy and Phytochemistry*, 15(2), 145-148.
59. Tikadar, P., *et.al.* (2020). Phytochemical profiling of selected medicinal plants used by Paraja tribe of Koraput, India. Copyright@ EM Int, 26(1), 2020-148.
60. Chahal, Rubal *et. al.* (2021). "Ageratum conyzoides L. and Its Secondary Metabolites in the Management of Different Fungal Pathogens" *Molecules* 26, no. 10: 2933. <https://doi.org/10.3390/molecules26102933>
61. Sharma, S., & Lata, S. (2022). Ethnobotanical importance of Asteraceae plants among Tharu tribe in Udham Singh Nagar, Uttarakhand, India. *Ethnobotany Research and Applications*, 23(34).
62. Maddineni, B., *et.al.* (2023). Identification of Bioactive Compounds from Leaf Methanolic Extracts of *Adhatoda vasica* (L.) Nees and *Psidium guajava* L. by GC-MS Profiling. *Current Trends in Biotechnology and Pharmacy*, 17(3), 946-958.
63. Ghanta P, *et.al.* (2020). Potential of pyrroquinazoline alkaloids from *Adhatoda vasica* Nees. as inhibitors of 5-LOX - a computational and an in-vitro study. *J Biomol Struct Dyn*. 2020; 23: 1-12.
-

64. Ravikiran J. Sawant, *et.al.* (2020) "Phytochemical Profiling Of Crude Extracts of Some Medicinal Plants Found In Gangapur Region, District Aurangabad, Maharashtra." *Quest Journals Journal of Research in Pharmaceutical Science*, vol. 06, no. 03, 2020, pp. 20-29.
65. Tikadar, P. *et.al.* (2020). Phytochemical profiling of selected medicinal plants used by Paraja tribe of Koraput, India. *Ecology, Environment and Conservation*. 24. 148-154. Ageratum, Adhatoda, Achyranthes
66. Ali, M., *et.al.* (2021). Chemical constituents from the bark of *Albizia lebbeck* (L.) Benth., and whole plants of *Andrographis paniculata* (burm. F.) Nees and *Parthenium hysterophorus* L. *Ejpmr*, 2021,8(8), 634-641.
67. Kora, A. J. (2023). Plant saponin biosurfactants used as soap, hair cleanser, and detergent in India. Applications of Next Generation Biosurfactants in the Food Sector, 459-477.
68. Ali, M. (2017). Lupene Triterpenoids from the Stem Bark of *Albizia lebbeck*, Leaves of *Leptospermum scoparium* and Roots of *Nardostachys jatamansi*. *Acta Scientific Pharmaceutical Sciences*, 1, 06-16.
69. Gbokwe, N.H., *et.al.* (2020). Antibacterial profiling of methanolic leaf extracts and herbal cosmetic cream formulations containing the leaf extracts of *Urtica dioica*, *Amaranthus viridis* and *Aloe vera*. *World Journal of Biology Pharmacy and Health Sciences*, 02(03), 019-029.
70. Baraniak, Justyna, and Małgorzata Kania-Dobrowolska. (2022). "The Dual Nature of Amaranth—Functional Food and Potential Medicine" *Foods* 11, no. 4: 618. <https://doi.org/10.3390/foods11040618>
71. Timothy Prince Chidike Ezeorba *et. al.* (2022). Allistatin: A potent yet uncharacterized therapeutic nugget in *Allium sativum*, *Pharmacological Research - Modern Chinese Medicine*, Volume 3,2022,100121, ISSN 2667-1425, <https://doi.org/10.1016/j.prmcm.2022.100121>.
72. Priska, M., Peni, N., & Carvallo, L. (2019). Phytochemicals screening and antioxidant effectiveness of garlic (*Allium sativum*) from Timor Island. *Biosaintifika: Journal of Biology & Biology Education*, 11(1), 1-7.

73. Phontree, K., *et.al.* (2022). Potent Anti-Cutibacterium acnes Activity of the Essential Oils Derived from *Allium sativum*, *Gardenia jasminoides*, and *Hedychium coronarium* Cultivated in Thailand. *Philippine Journal of Science*, 151(3), 1077-1085.
74. Bassino *et.al.* (2020). "Protective Role of Nutritional Plants Containing Flavonoids in Hair Follicle Disruption: A Review" *International Journal of Molecular Sciences* 21, no. 2: 523. <https://doi.org/10.3390/ijms21020523>
75. Kushwaha, Pankaj *et.al.* (2023). The phytochemical profiling of Aloe vera through GC-MS and compounds activity validation at NCBI for industrial value addition of the plant. *South Asian Journal of Experimental Biology*. 13. 20-32. 10.38150/sajeb.13(1). p20-32.
76. Anover, V. H., *et.al.* (2023). Antimicrobial Activity of *Aloe vera* (*Aloe barbadensis* Miller) Root Extract Against *Escherichia Coli*, *Staphylococcus aureus*, and *Salmonella typhimurium*. In 9th International Scholars' Conference Proceedings.
77. Qureshi, M. S., *et.al.* (2022). Formulation and characterization of *Anacyclus pyrethrum* Emulgels and its *in vitro* and *in vivo* evaluation as cosmeceutical product. *Journal of Cosmetic Dermatology*, 21(12), 7116-7130.
78. Yafout, M., *et.al.* (2021). A discussion of the therapeutic benefit of the medicinal plants used for the traditional treatment of vitiligo in Morocco. safety, 8, 9.
79. Hao, D. C., (2023). Evaluating potentials of species rich taxonomic groups in cosmetics and dermatology: Clustering and dispersion of skin efficacy of Asteraceae and Ranunculales plants on the species phylogenetic tree. *Current Pharmaceutical Biotechnology*, 24(2), 279-298. *Anacyclus pyrethrum*
80. Messire, G., *et.al.* (2023). Antioxidant Effects of Catechins (EGCG), Andrographolide, and Curcuminoids Compounds for Skin Protection, Cosmetics, and Dermatological Uses: An Update. *Antioxidants*, 12(7), 1317.
81. Adeleye, O. A., *et.al.* (2019). Antimicrobial activity and stability of *Andrographis paniculata* cream containing shea butter. *Nigerian Journal of Pharmaceutical Research*, 15(1), 9-18.

82. Mohsin, S., & Akhtar, N. (2017). Formulation and stability evaluation of *Bauhinia variegata* extract topical emulsion. *Acta Pol Pharm*, 74(3), 945-954.
83. Yadav, L. P., et.al. (2023). Isolation and Characterization of *Bauhinia variegata* for The Prevention & Treatment of Skin Infection. *Journal of Advanced Zoology*, 44(S-3), 240-255.
84. Jayachitra, J., et.al. (2020). Phytochemical analysis and mineral composition of Methanolic extract of *Boerhavia diffusa* L. *Research Journal of Pharmacy and Technology*, 13(10), 4856-4860.
85. Kumar, S. et.al. (2020). Determination of Bioactive Compounds of *Boerhaavia diffusa* Linn. Leaf Using IR Irradiation. *International Journal of Pharmacy and Biological Sciences-IJPBS* (2020) 10 (2): 222-228
86. Juneja, K., et.al. (2020). Metabolite profiling and wound-healing activity of *Boerhavia diffusa* leaf extracts using in vitro and in vivo models. *Journal of traditional and complementary medicine*, 10(1), 52-59.
87. Shiddamallayya et. al. (2015). Biodiversity of ayurvedic cosmetic plants of Bangalore Urban, *Species*, 2015, 12(35), 92-96.
88. George, Thooyavan & Karthikeyan, Jagadesan. (2016). Phytochemical profiling and GC-MS analysis of *Butea monosperma* seed methanol extract. *Journal of Pharmacognosy and Phytochemistry* 2016;(5) 152-157
89. Kumari, P., et.al. (2022). Ethnobotany, Phytochemistry and Pharmacology of Palash (*Butea monosperma* (Lam.) Taub.): a Systematic Review. *Curr Pharmacol Rep* 8, 188–204 (2022). <https://doi.org/10.1007/s40495-022-00286-9>
90. Mohammad Humayoon Amini, et.al. (2021). Important insights from the antimicrobial activity of *Calotropis procera*, *Arabian Journal of Chemistry*, Volume 14, Issue7,2021,103181, ISSN1878-5352, <https://doi.org/10.1016/j.arabjc.2021.103181>
91. Walaa S.A. et.al. (2022). *Calotropis procera* (Aiton) seeds fixed oil: Physicochemical analysis, GC–MS profiling and evaluation of its in-vivo anti-inflammatory and in-vitro antiparasitic activities, *Arabian Journal of*

Chemistry, Volume 15, Issue 9, 2022, 104085, ISSN 1878-5352,
<https://doi.org/10.1016/j.arabjc.2022.104085>.

92. Singh, S. P., *et.al.* (2020). Therapeutic application of *Carica papaya* leaf extract in the management of human diseases. *Daru : Journal of Faculty of Pharmacy, Tehran University of Medical Sciences*, 28(2), 735–744.
<https://doi.org/10.1007/s40199-020-00348-7>
93. Oguntoye, S.O., *et.al.* (2023). Eco-Friendly Formulation, Characterizations, Bioactivity Studies and In silico Evaluation of Cosmetic prepared from the Seed Oils of *Carica papaya*, *Dacryodes edulis* and *Raphia hookeri*. *The Chemist*, 14.
94. Dave, R.S., *et.al.* (2023). Comparative inhibitory screening of phytoconstituents from *Capparis decidua* against various ailments targets: a novel In-silico semblance ADME/Tox profiling studies. *ADV TRADIT MED (ADTM)* 23, 1153–1172. <https://doi.org/10.1007/s13596-022-00665-z>
95. Yosif Almoshari (2022). Medicinal plants used for dermatological disorders among the people of the kingdom of Saudi Arabia: A narrative review, *Saudi Journal of Biological Sciences*, Volume 29, Issue 6, 2022, 103303, ISSN 1319-562X, <https://doi.org/10.1016/j.sjbs.2022.103303>.
96. Singh, Balkar. (2014). Ethnobotanical uses of some plants from central Haryana, India. *Phytodiversity*. 1. 7-24.
97. Salamatullah, Ahmad. (2022). *Convolvulus arvensis*: Antioxidant, Antibacterial, and Antifungal Properties of Chemically Profiled Essential Oils: An Approach against Nosocomial Infections. *Life*. 12. 2138. [10.3390/life12122138](https://doi.org/10.3390/life12122138).
98. Yadav, S., *et.al.* (2009). Plants of Haryana useful in dermatological disorders: an Ethnobotanical Survey. *Pharmacognosy Reviews*, 3, 94-97.
99. Bylka, W., *et. al.* (2013). Review paper *Centella asiatica* in cosmetology. *Advances in Dermatology and Allergology/Postępy Dermatologii i Alergologii*, 30(1), 46-49. <https://doi.org/10.5114/pdia.2013.33378>
100. Khuanekaphan, M., *et.al.* (2020). Anti-aging potential and phytochemicals of *Centella asiatica*, *Nelumbo nucifera*, and *Hibiscus*
-

-
- sabdariffa* extracts. *Journal of advanced pharmaceutical technology & research*, 11(4), 174–178. https://doi.org/10.4103/japtr.JAPTR_79_20
101. Buranasudja, V., *et.al.* (2021). Insights into antioxidant activities and anti-skin-aging potential of callus extract from *Centella asiatica* (L.). *Sci Rep* 11, 13459. <https://doi.org/10.1038/s41598-021-92958-7>
102. Abouelnour, A. N., (2022). Morphological, phytochemical, and therapeutic potentials investigation of some species of *Cestrum* L.(Solanaceae family). *Bulletin of Faculty of Science, Zagazig University*, 2022(2), 1-21.
103. Samanta, A. K. (2019). Ethno-medicinal plants used for the treatment of skin diseases from the southern parts of West Bengal, India. *International Research Journal of Basic and Applied Sciences* ISSN: 2455-6718: RNI: WBENG/2016/76189, Vol. 4
104. Zagórska-Dziok, *et.al.* (2021). "Cosmetic and Dermatological Properties of Selected Ayurvedic Plant Extracts" *Molecules* 26, no. 3: 614. <https://doi.org/10.3390/molecules26030614>
105. Zakaria, N. N. A. B. (2019). Evaluation of anti-ageing properties of *Moringa oliefera* Lam., *Centella asiatica* (L.) Urban, *Clitoria ternatea* L. and *Cosmos caudatus* Kunth. for potential application as cosmeceuticals (Doctoral dissertation, Newcastle University). <http://theses.ncl.ac.uk/jspui/handle/10443/4726>
106. Dhangar, M. *et.al.* (2023). A Review on Butterfly Pea: An Emerging Plant with Applications in Food and Cosmetics. *International Research Journal of Modernization in Engineering Technology and Science*. Volume:05/Issue:05
107. Noureen, S., *et.al.* (2019). The genus *Cuscuta* (Convolvulaceae): An updated review on indigenous uses, phytochemistry, and pharmacology. *Iranian journal of basic medical sciences*, 22(11), 1225–1252. <https://doi.org/10.22038/ijbms.2019.35296.8407>
108. Roohaninasab, M., *et.al.* (2022). Beneficial esthetic lightening effects of *Cuscuta* extract on skin darkness in healthy individuals: A clinical trial
-

-
- study. *Journal of family medicine and primary care*, 11(11), 6890–6895.
https://doi.org/10.4103/jfmpe.jfmpe_783_22
109. Warintorn, R. et. al. (2023). Wound Healing Effect of Supercritical Carbon Dioxide *Datura metel* L. Leaves Extracts: An In Vitro Study of Anti-Inflammation, Cell Migration, MMP-2 Inhibition, and the Modulation of the Sonic Hedgehog Pathway in Human Fibroblasts. *Plants* 12, no. 13: 2546.
<https://doi.org/10.3390/plants12132546>
110. Onowoh, C. B., & Ujowundu, F. N. (2022). Phytochemical evaluation and functional group detection of ethanolic leaf and root extracts of *Datura metel* Chieme Sunday Chukwudoruo¹, Stanley Chukwuma Okereke², Chinyere Henrietta Onuoha¹, Olachi Lilian Osuagwu¹.
111. Tiwari, Amit et. al. (2022). In vitro antimycotic and antioxidant activity of *Eclipta alba* leaf extract against *Malassezia* yeast like fungi.
112. Khairullah, Aswin et. al. (2022). A review on phytochemistry and pharmacology of *Eclipta alba* L.: A valuable medicinal plant. *Research Journal of Biotechnology*. 17. 134-139. 10.25303/1703rjbt134139.
113. Timudom, Thanaroat, et. al. (2020). "Anti-Sebum Efficacy of *Phyllanthus emblica* L. (Emblica) Toner on Facial Skin" *Applied Sciences* 10, no. 22: 8193. <https://doi.org/10.3390/app10228193>
114. Puxvadee Chaikul, et. al. (2021). *Phyllanthus emblica* L. (amla) branch: A Safe And Effective Ingredient Against Skin Aging, *Journal of Traditional And Complementary Medicine*, Volume 11, Issue 5,2021, Pages 390-399, ISSN 2225-4110, <https://doi.org/10.1016/j.jtcme.2021.02.004>
115. Charles, N. N. O., & Bonareri, N. L. (2021). Antimicrobial And Phytochemical Screening Of *Euphorbia hirta* used By Abagusii Mothers In Treatment Of Infectious Diseases Among Young Children. *IJAR*, 7(2), 283-288.
116. Jagtap, M. P. et. al. (2020). Formulation And Development Of Anti-Acne Serum Using *Euphorbia hirta*. *International Journal Of All Research Writings*, 2(12), 171-179.
-

117. Santos Nascimento, et. al. (2021). "Phenolic Compounds from Leaves and Flowers of *Hibiscus roseus*: Potential Skin Cosmetic Applications of an Under-Investigated Species" *Plants* 10, no. 3: 522. <https://doi.org/10.3390/plants10030522>
118. Sağlam, A., et. al. (2023). Determination of Sun Protection Potential of *Hibiscus rosa-sinensis* as Natural Additive for Cosmetic Industry. *Bulletin of Biotechnology*, 4(1), 13-16.
119. El Massoudi, Soukaina et. al. (2023). "Phenolic Composition and Wound Healing Potential Assessment of Moroccan Henna (*Lawsonia inermis*) Aqueous Extracts" *Cosmetics* 10, no. 3: 92. <https://doi.org/10.3390/cosmetics10030092>
120. Kalita, H., et. al. (2022). Formulation and Evaluation of Natural Herbal Hair Dye Gel Using *Lawsonia inermis* (Henna Leaves) and Skin Irritation Studies in Albino Rats. *Journal of Pharmacy and Pharmacology*, 10, 18-24.
121. Dange, V., et. al. (2020). Formulation and evaluation of herbal gel containing *Lantana camara* for management of Acne vulgaris. *Journal of University of Shanghai for Science and Technology*, 22(11), 799-809.
122. Hamed, T. A., et. al. (2023, July). Antibacterial Activity and Extraction of Triterpenoid to *Lantana camara* L. in Iraq. In IOP Conference Series: *Earth and Environmental Science* (Vol. 1215, No. 1, p. 012062). IOP Publishing.
123. García-Villegas, A., et. al. (2023). The Potential of *Mangifera indica* L. Peel Extract to Be Revalued in Cosmetic Applications. *Antioxidants*, 12(10), 1892.
124. El-Nashar, Heba A. S. et.al (2022). A New Xanthone Glycoside from *Mangifera indica* L.: Physicochemical Properties and in vitro Anti-Skin Aging Activities" *Molecules* 27, no. 9: 2609. <https://doi.org/10.3390/molecules27092609>
125. Rahmadi, A., et. al. (2023). Characterisation of Sheet Masks with the Addition of Kemuning Leaf Extract (*Murraya paniculata* L.). *Edumaspul: Jurnal Pendidikan*, 7(2), 2481-2484.

126. Ruanmai, S. (2019). Effect of extraction solvents on biological activities of *Murraya paniculata* leaves in cosmetic application.
127. Sriwatcharakul, S., et. al. (2023). Antimicrobial activities and phytochemicals of *Murraya paniculata* L. flowers, leaves, and bark crude extracts. *Malaysian Journal of Microbiology*, 19(1).
128. Lorion, C., et. al. (2023). Elastogenic potential and antisagging properties of a novel *Murraya koenigii* extract. *Journal of Cosmetic Dermatology*.
129. Chaudhary, A. (2020). A Review on the Culinary Uses and Therapeutic Properties of *Murraya koenigii*. *Journal of Advancement in Pharmacognosy*, 1(1), 1-8.
130. Gahtori, R., et. al. (2023). Phytochemical Screening of *Nyctanthes arbor-tristis* Plant Extracts and Their Antioxidant and Antibacterial Activity Analysis. *Applied Biochemistry and Biotechnology*, 1-21.
131. Bhalakiya, H., & Modi, N. R. (2019). Traditional medicinal uses, phytochemical profile, and pharmacological activities of *Nyctanthes arbor-tristis*. *RJLBPCS*, 5, 1003-1023.
132. Tungmunnithum, D., et. al. (2022). Validation of a high-performance liquid chromatography with photodiode array detection method for the separation and quantification of antioxidant and skin anti-aging flavonoids from *Nelumbo nucifera* Gaertn. stamen extract. *Molecules*, 27(3), 1102.
133. Noysang, C., & Boonmatit, N. (2019). Preliminary Phytochemicals and Pharmacologic Activities Assessment of White and Pink *Nelumbo nucifera* Gaertn. Flowers. *Applied Mechanics and Materials*, 891, 41-51.
134. Linsaenkart, Pichchapa, et.al. (2023). "Natural Melanogenesis Inhibitor, Antioxidant, and Collagen Biosynthesis Stimulator of Phytochemicals in Rice Bran and Husk Extracts from Purple Glutinous Rice (*Oryza sativa* L. cv. Pieisu 1 CMU) for Cosmetic Application" *Plants* 12, no. 4: 970. <https://doi.org/10.3390/plants12040970>

135. Farhamzah, F., *et.al.* (2022). Sun Protection factor activity of black glutinous rice emulgel extract (*Oryza sativa* var *glutinosa*). *Indian Journal of Pharmaceutical Education and Research*, 56(1), 302-310.
136. Anunthawan, T., & Rimlumduan, T. (2023). Antioxidant activity, anti-tyrosinase activity, and lipstick pigments of *Oryza sativa* Linn. and *Carissa carandas* Linn. extracts. *Journal of Applied Pharmaceutical Science*, 13(10), 217-224.
137. Zakaria, N. *et.al.* (2020). Antioxidant and phytochemical content of commercial brown rice (Ecobrown) and white rice (Jasmine, Jati Super Special and Mango Thai) for potential cosmetic rice powder raw materials. *Journal of Tropical Resources and Sustainable Science (JTRSS)*, 8(2), 114–118. <https://doi.org/10.47253/jtrss.v8i2.632>
138. Fugare, Akshay, *et.al.* (2021). A Review on *Pongamia pinnata* (L.): Traditional Uses, Phytochemistry and Pharmacological Properties. *Journal of Drug Delivery and Therapeutics*. 11. 207-211. 10.22270/jddt.v11i1-s.4522.
139. Dewage, D. D., *et.al.* (2022). Guava (*Psidium guajava* L.) Leaves as a source of phytochemicals with antioxidant, antimicrobial and photoprotective properties for sunscreen formulations. International Conference on Applied and Pure Sciences, 2022 Faculty of Science, University of Kelaniya, Sri Lanka.
140. Periasamy, H., *et. al.* (2019). In vitro antibacterial activity of plumbagin isolated from *Plumbago zeylanica* L. against methicillin-resistant *Staphylococcus aureus*. *Letters in applied microbiology*, 69(1), 41-49.
141. Dwivedi, S., *et. al.* (2023). Effect of extraction solvent and plant part on the yield of phenolic compounds, plumbagin and biological activity of *Plumbago zeylanica*. *Journal of Pharmacognosy and Phytochemistry*, 12(6), 05-10.
142. Mysore, V., & Arghya, A. (2022). Hair Oils: Indigenous Knowledge Revisited. *International Journal of Trichology*, 14(3), 84-90. https://doi.org/10.4103/ijt.ijt_189_20

143. Kabila, B., *et al.* (2020). The identification of phytochemicals of medicinal important in *Senna occidentalis* (L.) Link. *Plant Archives*, 20(2), 4773-4781.
144. Yakubu, O. E., *et al.* (2021). Comparative determination of antioxidant activities and phytochemicals from fractions of ethanol extract of *Senna occidentalis* using GC-MS. *J Emerg Technol Innov Res*, 8(7), 195-211.
145. Padule K, *et al.* (2022). The Advancement of Herbal-Based Nanomedicine for Hair. *Cosmetics*. 2022; 9(6):118. <https://doi.org/10.3390/cosmetics9060118>
146. Umar, S., & Carter, M. J. (2021). A Multimodal Hair-Loss Treatment Strategy Using a New Topical Phytoactive Formulation: A Report of Five Cases. *Case Reports in Dermatological Medicine*, 2021. <https://doi.org/10.1155/2021/6659943>
147. Kolekar YS, *et al.* (2021). Medicinal plants used in cosmetics for skin and hair care. *Int J. Pharm Chem Anal* 2021;8(2):36-40.
148. Narra, K., Naik, *et al.* (2023). A Study of Efficacy and Safety of Ashwagandha (*Withania somnifera*) Lotion on Facial Skin in Photoaged Healthy Adults. *Cureus*, 15(3), e36168. <https://doi.org/10.7759/cureus.36168>
149. Imokawa, Genji, and Koichi Ishida. (2014). Inhibitors of Intracellular Signaling Pathways that Lead to Stimulated Epidermal Pigmentation: Perspective of Anti-Pigmenting Agents. *International Journal of Molecular Sciences* 15, no. 5: 8293-8315. <https://doi.org/10.3390/ijms15058293>
150. Jezierska, A., & Sykuła, A. (2023). Antioxidant properties of *Moringa oleifera* and *Withania somnifera* extracts and their use in cosmetics for men. *Biotechnology and Food Science*, 85(1), 34-42. <https://doi.org/10.34658/bfs.2023.85.1.34-42>