



## Study of some medicinal plants used in preparation of herbal skin care

Vipin Chandra\*, Sanjeev Lal, Aaradhna Chauhan

Assistant Professor, Department of Botany, RCU Govt PG College, Uttarkashi, Uttarakhand, India

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### Abstract

It has always been desired in the heart of man to look beautiful, whether he gets success or not, but still he has been using different types of substances to make the body beautiful and as man's nature will continue to do. Presently, skin-care products and cosmetics are part of the day-today life of numerous people. Skin care products are the healing preparations that are applied to some external parts of the human body. A number of herbal products has been used and evaluated for innovation and treatment of skin diseases since ancient times. Herbal extracts have numerous properties such as they have pigmentation inhibition, antioxidant property and antimicrobial activity and hence, herbal extracts are predominantly added to skin care preparations. The traditional medicines which individuals use currently are made from medicinal plants and minerals. One of the benefits of herbal cosmetics is, medicinal plants are extensively available, affordable, eco-friendly and having less or no harmful effects as compared to synthetic drugs and even can be grown in household/kitchen gardens. The aim of current study is to document the medicinal plants which are being used in manufacturing of herbal Skin care.

**Keywords:** herbal cosmetics, medicinal plants, herbal products, household/kitchen gardens, skin-care products

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### Introduction

Skin is the layer of usually soft, flexible outer tissue covering the body of a vertebrate animal, with three main functions: protection, regulation, and sensation [1]. The beauty of skin and hair basically depends on individuals' health, diet, habits, job routine, environmental conditions and maintenance. Due to direct contact with environment the various chemical toxin, microorganisms, pollution, sunlight can cause damage to the skin [2]. To keep their skin attractive and away from diseases, humans use various medicines called cosmetics. On the basis of ingredients, cosmetics are two types synthetic cosmetics derived from synthetic chemical and herbal cosmetic derived from natural ingredients called herbal cosmetics. Now a days, in the whole world there is turn to return towards the use of herbal products and to adopt more natural way of life. All this happen due to the excessive use of synthetic based products, synthetic chemicals, synthetic dyes and their derived products in last one and half century; their production and usage cause human health hazard with several side effects leading to numerous diseases. Allopathic system alone is providing insufficient and there is need to supplement it with herbal drugs. The need for herbal cosmetics product is increasing rapidly in comparison to conventional cosmetics due to lesser side effects [3]. Natural ingredients in the herbs do not possess any unwanted or side effect on the skin of the human body but supplement the skin with nourishment and other favorable nutrients. Apart from this, the use of herbal products is friendly to environment and do not have any unfavorable consequence to environment. It is not new for humans to use plants parts to take care of their skin. The record on the use of herbal skin products has been found from 1550 B.C. to Indus valley civilization [4]. When skin is exposed to the sunlight, it produces several reactive species which can cause oxidative damage or react with cellular proteins and DNA. These can lead to skin cancer, pigmentation of the skin, aging of the skin, wrinkle formation, and loss of elasticity [5]. Herbal extracts possess various properties such as anti-aging, photo protective, astringent, moisturizing, antioxidant, antimicrobial, etc. so can help to prevent these problems. In last decade, herbal products have attained increased popularity. Herbal cosmetics are used broadly all over the world for sustaining and brushing to beautify, radiating the face and other body parts, e.g., hand, face, hair, lips, eye and other body parts. Herbal Cosmetics are available in numerous formulations which include creams, face pack, hair oil, lotions, powder, face wash, lip balm etc. People are fascinated towards herbal cosmetic products in current times. Herbal cosmetics are composed by incorporating phytochemicals from various botanical sources (Plant leaves, roots, stem, flowers, flower bud etc.), affecting the skin, and allocate nutrients which are beneficial for the healthy and glowing skin. Therefore, it become necessary to know more about the plants which can be used as herbal skin care so the objective of our study.

### Advantages of Herbal Cosmetics over synthetic cosmetics [6]

Due to natural origin, herbal skin care has always been better than synthetic skin products made of artificial chemicals. Following is some of the advantages of using natural cosmetics which make them a better choice over the synthetic ones:

### 1. Natural in origin

Herbal skin care is fully natural in origin because they are derived from different parts of plants.

### 2. Safe to use

Natural cosmetics are protected to utilize. They are hypo-allergenic and tested and proven by dermatologists to be safe to use anytime, anywhere. Since they are made of natural ingredients, people don't have to worry about getting skin rashes or experience skin itchiness.

### 3. Compatible with all skin types

No matter if you are dark or fair; you will find natural cosmetics like foundation, eye shadow, and lipstick which are appropriate irrespective of your skin tone. Women with oily or sensitive skin can also use them and never have to worry about degrading their skin condition.

### 4. Wide range of product

Herbal skin care product is new in market in comparison to synthetic skin care product yet they provide customers with a variety of products according to their needs like skin tonner, skin moisturizer, skin cream, skin soaps, lip balm, face pack etc.

### Study Area

The study was conducted in Uttarkashi town the nearby villages like, Ladari, Tiloth, Dharasu, Matli, Dunda, Kotiyal gaon, Kot Bunglow, Mando gaon, Maneri, and Daang. Uttarkashi district is situated in the north western part of Uttarakhand state of India which is situated at latitude 30°44'2" N, 78°17'2" E and longitude 30.73° N, 78.45° E. The total geographical area of Uttarkashi district is 8,016 sq. kms. And the total forest area is 6,924 sq. kms.



Source: <https://www.mapsofindia.com>

**Fig 1:** Map of Study Area

### Methodology

Detailed surveys related to herbal skin care were made in the villages nearby Uttarkashi. The formal and informal interviews were conducted with the local people of different area and age group. Review of literature of plants which are being used in herbal cosmetics was also done.

### Results

Twenty-one plants which is used in preparation of skin care product, selected after a data obtained from interviewing of different people and detailed study of related literature available on internet and books. brief description as follows

1. **Botanical Name-** *Aloe barbadense*

**English Name / Vernacular Name-** Indian Aloe / Ghrita Kumari

**Family-** Liliaceae

**Used Part-** leaf

**Phytochemical Compounds-** minerals, sugars, saponins, salicylic acids and amino acid Anthraquinones, and fatty acids [7-9].

**Pharmacological Properties-** Healing, protective effect against radiation damage to the skin, Anti-inflammatory, Antiviral, anti-bacterial, Antiseptic Moisturizing and anti-aging effect. [10-16].

**Effects on Skin-** Helps soothe sunburn, moisturize the skin, Boosts healing of wounds, Fights skin-ageing, reduces infection and acne, helps in hair growth, keeps dandruff at bay, Acts as a conditioner to the hair and scalp [10-16].

**2. Botanical Name-** *Azadirachta indica*

**English name / Hindi Name-** Neem Tree, Margosa Tree / Nim

**Family-** Meliaceae

**Used part-** Seed oil

**Phytochemical Compounds-** Azadirachtin and related limonoids, the seed oil contains glycerides, diverse polyphenols, nimbolide, triterpenes, fatty acids and beta itosterol the yellow, bitter oil has a garlic like odor and contains about 2% of limonoid Compounds. [17-21].

**Pharmacological Properties-** Antifungal, Antibacterial, Insecticidal, Anti-inflammatory, cleanser, antioxidant, Antimalarial [17-21].

**Effects on Skin-** Clean face, remove harmful microorganism, Treats acene, eczema, dermatitis, and furunculosis, soothe irritated skin, anti-ageing, remove blackheads. Fights Skin Damage [17-21].

**3. Botanical Name-** *Brassica campestris*

**English name / Vernacular and Hindi Name-** Yellow Mustard / Sarson

**Family-** Brassicaceae

**Used Part-** Seed oil

**Phytochemical Compounds-** Erucic Acid, Linoleic Acid, Oleic Acid, Linolenic Acid, Eicosenoic Acid and vitamin E [22-25].

**Pharmacological Properties-** Antioxidants [22-25].

**Effect on skin-** Nourish and replenish skin [22-25].

**4. Botanical Name-** *Butyrospermum parkii*

**English Name-** Shea tree, shi tree, or vitellaria,

**Family-** Sapotaceae

**Used Part-** Oil from fruit Nut (shea butter)

**Phytochemical Compounds-** Palmitic, stearic, oleic, linoleic, and arachidic acids. About 85% to 90% of the fatty acid composition is stearic and oleic acids. Vitamin E, Phenolic compounds (mainly catechins) and calcium [26].

**Pharmacological properties-** Anti-inflammatory, Free radical scavenger, Antimicrobial [26, 27].

**Effects on Skin-** It promotes soft and supple skin, reduce old scar, promotes healing [28]. reduce dandruff. Fight against acne, psoriasis and eczema, in west most commonly used as an emollient in cosmetics [29].

**5. Botanical Name-** *Carica papaya*

**English name / Hindi Name-** Papaya / Papita

**Family-** Caricaceae

**Used Part-** Fruit

**Phytochemical Compound-** Minerals (Na, Mg, K, Mn, Fe), Vitamin A Vit.C, Vitamin B complex, Enzyme Papain and chymopapain, B- carotene, cryptoxanthin [30].

**Pharmacological Properties-** Anti aging, Anti-Inflammatory, Antioxidant [30].

**Effects on Skin-** Remove pimples as well as wrinkles. Bleaching agent. By dissolving keratin, papain helps to exfoliate the top layer of dead skin cells, leaving skin looking brighter with a more even tone. Skin cleanser. Fights Dandruff [30].

**6. Botanical Name-** *Citrus reticulata*

**English name / Hindi Name-** Mandarin Orange / Santara

**Family-** Rutaceae

**Used Part-** Fruit peel

**Phytochemical-** Essential oil (Mainly Limonene), Vitamin C [31].

**Pharmacological Properties-** Antifungal, antibacterial, Anti-inflammatory, Cleansing, antioxidative, Anti-aging in nature [31-34].

**Effects on Skin-** Reduce fine lines, Black heads, Pimples, Acene and wrinkles. Improves and brightens overall skin tone by increasing collagen production in our skin. Fight against microorganism. Promotes the growth of new cells and wound healing [32-34].

**7. Botanical Name-** *Citrus aurantifolia***English name / Hindi Name-** Lime / Kaghzi - Nimbu**Family-** Rutaceae**Used part-** Fruit Peel**Phytochemical Compounds-** Flavonoids, limonoids, kaempferol, quercetin, and ascorbic acid [35,36].**Pharmacological Properties-** It has excellent antioxidant, microbial, and anti-inflammatory properties [35,36].**Effects on Skin-** Lime peel extract is often added to skin care products as a fragrance ingredient because it contains the fragrance chemicals bergapten and limonene. Prevent from UV rays, Anti-aging, improve skin tone, remove dead cells, stimulate collagen synthesis [35,36].**8. Botanical Name-** *Crocus sativus***English name / Hindi Name-** Saffron/kesar**Family-** Iridaceae**Used Part-** Stigma**Phytochemical Compounds-** Main are monoterpenoids, crocin, quercetin, Crocin, Picrocrocin, Safranal, kaempferol, [37].**Pharmacological Properties-** Anti-UV Agent [38], Antioxidant [39], Anti-Aging [41]**Effects on Skin-** Keep skin moisturized and smooth [38], Prevents Skin Cancer [40], lightening agent, reduce a skin condition called erythema [41], Perfumery, used to color cosmetics,**9. Botanical Name-** *Curcuma longa***English name / Hindi Name-** Turmeric/ haldi**Family-** Zinziberaceae**Used part-** Underground rhizome**Phytochemical Compounds-** Curcuminoids (Curcumin) and Essential oils (Mixture of sesquiterpene ketones and alcohols, d-sabinene,  $\alpha$ -phellandrene, cineole, borneol, and zingiberencum-in [42-44]**Pharmacological Properties-** The essential oils may have antioxidant, anti-inflammatory and anti-nociceptive properties [44]. Curcumin has anti-inflammatory, anti-oxidant, antimicrobial, hypoglycemic, wound healing, chemo preventive, chemosensitising and radiosensitising properties [45].**Effects on Skin-** Regulate sebum production in human skin. Persons with excessively oily skin or are suffering from acne will greatly benefit from this property it brings a healthy glow to the skin and makes them beautiful [46].**10. Botanical Name-** *Cucumis sativus***English name / Hindi Name-** Cucumber/ kheera**Family-** Cucurbitaceae**Used Part-** Fruit**Phytochemical Compounds-** Rich in phytochemical compounds, cucurbitacin, phenolic compounds, vitamins, minerals, fatty acids, and essential oils [47]**Pharmacological Properties-** Antimicrobial, antioxidant, anti-inflammatory, anticancer, antidiabetic, antiwrinkle, and analgesic agent [47].**Effects on Skin-** Reduce Redness of Skin, Reduce Wrinkle and Pimples [47].**11. Botanical Name-** *Coccus nucifera***English name / Hindi Name-** Coir /Nariyal**Family-** Arecaceae**Used part-** oil obtained from Dried Coconut Kernels**Phytochemical Compounds-** Triglycerides (lauric acid, stearic acid, myristic acid, palmitic acid, oleic acid and Linoleic acid) and several derivatives [48].**Pharmacological Properties-** Antifungal, antibacterial and antiviral, anti-ageing healing & moisturizing properties [48].**Effects on Skin-** Anti UV rays, soften the skin and relieve flaking and dryness, prevents wrinkles and age spots, lubricate skin, Prevent from infection, psoriasis, eczema, and Dermatitis, healthy hair growth [48].**12. Botanical Name-** *Glycyrrhiza glabra***English name / Vernacular Name-** Liquorice / Mulhatti**Family-** Fabaceae**Used part-** Roots**Phytochemical Compounds-** Saponins, flavonoids, chromenos, coumarins, dihy-drostilbenes, coumestans, benzofurans, and dihydrophen, anthrenes [48].**Pharmacological Properties-** Skin-whitening, anti-sensitizing, anti-inflammatory, Anti-Tyrosinase, Antimelanogenic [49], Antiwrinkle and Photoprotective Activity [50].**Effects on Skin-** Reduce dark spot Wrinkle and Acene [49], Improve brightness of skin Protect skin against oxidative damage [50], promote hair growth [51].

**13. Botanical Name-** *Hemidesmus indicus***English name / Vernacular Name** - Indian sarsaparilla / Anantmul**Family**- Asclepiadaceae**Used par**- Essential oil from Roots**Phytochemical Compounds**- 2-Hydroxy-4-methoxybenzaldehyde (92%) as the major constituents. Other constituents are nerolidol, borneol, linalyl acetate, dihydrocarvyl acetate, salicylaldehyde, isocaryophyllene,  $\alpha$ -terpinyl acetate etc <sup>[52]</sup>.**Pharmacological Properties**- Antimicrobial activity, antifungal activity, antiacne activity, anti-inflammatory activity, anti-enterobacterial activity <sup>[52]</sup> and anti-oxidant <sup>[53]</sup>.**Effects on Skin**- Clean Face, remove Wrinkle, Pimples and Acne <sup>[53]</sup>.**14. Botanical Name-** *Medicago sativa***English name / Local Name** - Alfalfa/ Bathhua**Family** - Fabaceae**Used Part** - Leaf**Phytochemical Compounds**- Polyphenolic compounds <sup>[54]</sup>.**Pharmacological Property**- strong antioxidant, anti-inflammatory, antifungal, and antiallergic properties <sup>[54]</sup>.**Effects on Skin**- Regulate sebum production in human skin. Persons with excessively oily skin or are suffering from acne will greatly benefit from this property <sup>[54]</sup>**15. Botanical Name-** *Melaleuca alternafolia***English name** - Tea tree**Family** - Lamiaceae**Used part** - Tea tree oil from Leaf**Phytochemical Compounds** - 1, 8-Cineole, limonene, terpinen-4-ol, myrcene,  $\alpha$ -pinene, linalool, sabinene,  $\alpha$ -terpinene,  $\gamma$ -terpinene,  $\alpha$ -terpineol,  $\beta$ -pinene  $\alpha$ -phellandrene, terpinolene and  $p$ -cymene (55).**Pharmacological Properties** - Antimicrobial, fungicidal, antibacterial, antiviral, stimulant, disinfectant, antiseptic, anti-infectious, antipyretic, vulnerary, expectorant, balsamic, cicatrisant, sudorific and Insecticide (55).**Effects on Skin** - It reduces scars and marks by stimulating the growth of new skin cells and eliminates the dead skin cells. Tea tree oil is an excellent remedy for acne. Tea tree oil fights against the harmful agents causing dandruff and nourishes the dry scalp with its moisturizing properties and it also kills head lice (55).**16. Botanical Name-** *Olea europea***English name / Vernacular Name**- Olive tree / Jaitun**Family**- Oleaceae**Used part**- Oil from fruit (Olives)**Phytochemical Compounds**- Hydroxytyrosol (2-(3, 4-di-hydroxyphenyl) ethanol) and tyrosol (2-(4-hydroxyphenyl) ethanol). These are phenolic compound <sup>[56, 57]</sup>.**Pharmacological properties**- Antimicrobial, anticarcinogenic, anti-inflammatory and antioxidant activities <sup>[56, 57]</sup>.**Effects on Skin**- Reducing oxidative damage, and promoting dermal reconstruction. Useful in burn cases <sup>[56, 57]</sup>.**17. Botanical Name-** *Prunus Amygdalus dulcis***English name / Vernacular Name**- Almond/ Badam**Family**- Rosaceae**Used Part**- oil obtained from almonds**Phytochemical Compounds**- Oleic acid (up to 86%),  $\beta$ -sitosterol (up to 87%) <sup>[58]</sup>,  $\alpha$ -tocopherol <sup>[59]</sup>**Pharmacological Properties**- Anti-ageing, anti-oxidant <sup>[58]</sup>.**Effects on Skin**- Almond oil has emollient and sclerosant properties, which have been used to improve complexion and skin tone. Good for sensitive skin like bay skin <sup>[60]</sup>.**18. Botanical Name-** *Persea americana***English Name**- Avocado, Alligator pear**Family**- Lauraceae**Used Part**- Oil from pulp of the fruit**Phytochemical Compound**- Linoleic acid, linolenic acid and oleic acid. It also contains  $\beta$ -sitosterol,  $\beta$ -carotene, lecithin, minerals, and vitamins A, C, D, and E <sup>[61]</sup>.**Pharmacological Properties**- It reduces scars and marks avocado oil is an excellent remedy for acne. Fights against the harmful agents causing dandruff and nourishes the dry scalp with its moisturizing properties and it also kills head lice <sup>[61]</sup>.**Effects on Skin**- It is an excellent source of enrichment for dry, damaged, or chapped skin <sup>[62]</sup>.

**19. Botanical Name-** *Rosmarinus officinalis***English Name-** Rosemary**Family-** Labiatae**Used part-** leaf**Phytochemical Compounds-** Rosemary contains a number of phytochemicals, including rosmarinic acid, camphor, caffeic acid, ursolic acid, betulinic acid, carnosic acid, and carnosol. Rosemary essential oil contains 10–20% camphor<sup>[63]</sup>.**Pharmacological Properties-** Antioxidant<sup>[63]</sup> and antibacterial<sup>[64]</sup>.**Effects on Skin-** Active in preventing cutaneous photo damage induced by UV radiations<sup>[63]</sup>. Remove Acne<sup>[64]</sup>.**20. Botanical Name-** *Rubia cordifolia***English name / Vernacular Name-** Indian madder/Manjistha**Family-** Rubiaceae**Used part-** Root**Phytochemical Compounds-** Anthraquinones and naphthohydroquinones<sup>[65]</sup>**Pharmacological Properties-** Antibacterial<sup>[66]</sup> ant psoriatic<sup>[67]</sup>, free radical scavenger<sup>[68]</sup>.**Effects on Skin-** Skin lightning agent, reduce inflammation and rashes of skin, manage acne and pimples by eliminating acne-causing bacteria<sup>[69]</sup>.**21. Botanical Name-** *Simmondsia chinensis***English name-** Jojoba**Family-** Simmondsiaceae**Used Part-** Seed oil (wax)**Phytochemical Compounds-** long-chain (C36-C46) esters of fatty acid and fatty alcohol<sup>[70]</sup> Tocopherols<sup>[71]</sup>**Pharmacological Properties-** Antibacterial, antifungal, antioxidant<sup>[72]</sup>.**Effects on Skin-** Reduce skin-related oxidative stress<sup>[73]</sup>, enhance skin hydration, moisturizing the skin<sup>[74]</sup>.**Conclusion**

Present study reveals that the use of herbal skin care cosmetics over synthetic products has benefits. 21 herbal plant species were identified and documented in our work which can be used in preparation of herbal skin care products. These plants have health benefits as well as beautifying properties like skin tightening, skin whitening, anti-ageing and anti-wrinkle. Apart from many the use of herbal products for skin, the herbal hair products are also in high demand. As the demand of herbal cosmetics is increasing enormously from last few years. So, to know about herbal plant species is very important. However, there are many herbal products available in the cosmetic industry. Still the knowledge of herbal plants is very scanty. Selective research approach needed to prove clear relation between chemical constituent and skin care cosmetic effect of selected medicinal plants, which may further provide the bases to use of selected chemical compound in cosmetic products in future. Hence this work will be helpful to know about more plant species which can used to prepare herbal products.

**References**

1. "Structure and Function of The Skin | Wound Care Education". CliniMed. Archived from the original on 2019-01-31. Retrieved, 2019.
2. Kapoor VP. Herbal Cosmetics for Skin and Hair Care. Indian Journal of Natural Products and Resources, [Formerly Natural Product Radiance (NPR)],2005:4(4):306-314.
3. Boudin AS, *et al.* social science medicine,1999:49:279-289.
4. Patkar K. Herbal Cosmetics in Ancient India. Indian Journal of Plastic Surgery,2008:41:134-137.
5. Chanchal D, Swarnlata S. Novel approaches in herbal cosmetics. Journal of Cosmetic Dermatology,2008:7:89-95.
6. Davinder Kumar, Gajendra Rajora, Om Parkash, Himanshu, Mamta Antil, Virender Kumar. International Journal of Advanced Scientific Research ISSN: 2456-0421 www.allscientificjournal.com,2016:1(4):36-41. Herbal cosmetics: An overview.
7. Atherton P. Aloe vera revisited. *Br J Phytother*,1998:4:76-83. [Google Scholar]
8. Shelton M. Aloe vera, its chemical and therapeutic properties. *Int J Dermatol*,1991:30:679-83. [PubMed] [Google Scholar]
9. Atherton P. The essential Aloe vera: The actions and the evidence, 1997, (2). [Google Scholar]
10. Hutter JA, Salmon M, Stavinoha WB, Satsangi N, Williams RF, Streep RT, *et al.* Anti-inflammatory C-glucosyl chromone from Aloe barbadensis. *J Nat Prod*,1996:59:541-3. [PubMed] [Google Scholar]
11. Chithra R Sajithlal GB, Chandrakasan G. Influence of aloe vera on collagen characteristics in healing dermal wounds in rats. *Mol Cell Biochem*,1998:181:71-6. [PubMed] [Google Scholar]
12. Hegggers J, Kucukcelebi A, Listengarten D, Stabenau J, Ko F, Broemeling LD, *et al.* Beneficial effect of aloe on wound healing in an excisional wound model. *J Altern Complement Med.*,1996:2:271-7. [PubMed] [Google Scholar]

13. Chithra P, Sajithlal G, Chandrakasan G. Influence of aloe vera on the glycosaminoglycans in the matrix of healing dermal wounds in rats. *J Ethnopharmacol*,1998;59:179-86. [PubMed] [Google Scholar]
14. Chithra P, Sajithlal G, Chandrakasan G. Influence of aloe vera on the glycosaminoglycans in the matrix of healing dermal wounds in rats. *J Ethnopharmacol*.1998;59:179-86. [PubMed] [Google Scholar]
15. Sato Y, Ohta S, Shinoda M. Studies on chemical protectors against radiation XXXI: Protective effects of *Aloe arborescens* on skin injury induced by x-irradiation. *Yakugaku Zasshi*,1990;110:876-84. [PubMed] [Google Scholar]
16. Byeon S, Pelley R, Ullrich SE, Waller TA, Bucana CD, Strickland FM. Aloe barbadensis extracts reduce the production of interleukin-10 after exposure to ultraviolet radiation. *J Invest Dermatol*,1988;110:811-7. [PubMed] [Google Scholar]
17. Ara I, Siddiqui BS, Faizi S, Siddiqui S. Structurally Novel Diterpenoid Constituents from the Stem Bark of *Azadirachta indica* (Meliaceae). *Journal of the Chemical Society, Perkin Transactions*,1989;1:34345. <https://doi.org/10.1039/p19890000343>.
18. David SN. Anti-pyretic of neem oil and its constituents. *Medi scope*,1969;12:25-27.
19. Fujiwara T, Sugishita E, Takeda T, Ogihara Y, Shimizu M, Nomura T, *et al*. Further studies on the structure of polysaccharides from the bark of *Melia azadirachta*. *Chem Pharm Bull*,1984;32:1385-91.
20. Bhargava KP, Gupta MB, Gupta GP, Mitra. Anti-inflammatory activity of seponins and other natural products. *Indian J. Med. Res.*,1970;58:724-730.
21. Chattopadhyay RN, Maitra SK, Chattopadhyay RR. Possible mechanism of anti-hyperglycemic effect of *Azadirachta indica* leaf extract: Part I. *Fitoterapia*,1993;64:332-335.
22. Cartea E, De Haro-Bailón A, Padilla G, Obregón-Cano S, Del Rio-Celestino M, Ordás A. Seed Oil Quality of *Brassica napus* and *Brassica rapa* Germplasm from Northwestern Spain. *Foods (Basel, Switzerland)*,2019;8(8):292. <https://doi.org/10.3390/foods8080292>.
23. Eskin NAM, Przybylski R. *Rape Seed Oil/Canola*. Editor(s): Benjamin Caballero, *Encyclopedia of Food Sciences and Nutrition (Second Edition)*, Academic Press, 2003, 4911-4916, ISBN 9780122270550, <https://doi.org/10.1016/B0-12-227055-X/01349-3>.
24. Rivera D, Rommi K, Fernandes MM, Lantto R, Tzanov T. Biocompounds from rapeseed oil industry co-stream as active ingredients for skin care applications. *International journal of cosmetic science*,2015;37(5):496-505. <https://doi.org/10.1111/ics.12222>
25. Temperate Plants Database, Ken Fern. Temperate. The ferns. info. 2021- temperate. The ferns.info/viewtropical.php?id=Brassica+napus.
26. Honfo FG, Akissoe N, Linnemann AR, Soumanou M, S VBMAJ. "Nutritional Composition of Shea products and chemical Properties of Shea Butter: A Review", *Critical Reviews in food Science and Nutrition*,2014;54(5):37-41.
27. Badoussi E, Azokpota P, Madodé YE, chobo FP, Fagla B, Kayodé APP, *et al*. "Cooking and drying processes optimization of *Pentadesma butyracea* kernels during butter production", *African Journal of Biotechnology*,2015;14(39):2777-2785.
28. Firemping CK, Mak-Mensah EE. "Chemical characteristics of toilet soap prepared from neem (*Azadirachta indica* A. Juss) seed oil", *Asian Journal of Plant Science and Research*,2011;1(4):1-7.
29. Garba ID, Sanni SA, Adebayo CO. "Analyzing the Structure and Performance of Shea ButterMarket in Bosso and Borgu Local Government Areas of Niger State, Nigeria", *International Journal of U- and E-Service, Science and Technology*, 2015, 8.
30. Traditional and Medicinal Uses of *Carica papaya* *Journal of Medicinal Plants Studies*,2015;1(1):7-15. ISSN:2320-3862.
31. Shyamapada Mandal<sup>1</sup> Manisha Mandal<sup>2</sup> Essential oils in Food Preservation Flavour and Safety-Tangerine (*Citrus reticulata* L. var.) Oils, 2016;(91):803-811.
32. Jae-Hee Park, Minhee Lee, Eunju Park. Antioxidant Activity of Orange Flesh and Peel Extracted with Various Solvents,2014;19(4):291-298. PMID:25580393.
33. Manthey JA, Bendele P. Anti-inflammatory activity of an orange peel polymethoxylated flavone, 3',4',3,5,6,7,8-heptamethoxyflavone, in the Rate carrageenan/paw edema and Mouse lipopolysaccharide-challenge assays,2008;56(20):9399-403. PMID:18816060.
34. Vinita Apraj D, Nancy Pandita S. Evaluation of Skin Anti-aging Potential of *Citrus reticulata* Blanco Peel,2016;8(3):160-168. PMID:27365982.
35. Nithithee Narang, Wannee Jiraungkoorskul Anticancer Activity of Key Lime, *Citrus aurantifolia*,2016;10(20):118-122. doi: 10.4103/0973-7847.194043. PMID: 28082795.
36. Jane Moores Vitamin C: A wound healing perspective, 2013. Suppl: S6, S8-11doi: 10.12968/bjcn.2013.18.sup12.s6. PMID: 24796079.
37. Winterhalter P, Straubinger M. Saffron-renewed interest in an ancient spice. *Food Rev. Int*,2000;16:39-59. [Google Scholar] [CrossRef].
38. Golmohammadzadeh S, Jaafari MR, Hosseinzadeh H. Does saffron have antisolar and moisturizing effects? *Iran. J. Pharm. Res*,2010;9:133-140. [Google Scholar] [PubMed].
39. Carmona M, Sanchez AM, Ferreres F, Zalacain A, Tomas-Barberan F, Alonso GL. Identification of the flavonoid fraction in saffron spice by LC/DAD/ MS/MS: Comparative study of samples from different geographical origins. *Food Chem*,2007;100:445-450. [Google Scholar] [CrossRef].

40. Das I, Chakrabarty RN, Das S. Saffron can prevent chemically induced skin carcinogenesis in Swiss albino mice. *Asian Pac. J. Cancer Prev.*,2004;5:70-76. [Google Scholar].
41. Xing HG, Li Z, Huachen W, Hong DC. Efficacy and safety of innovative cosmeceuticals. *Clin. Dermatol*,2008;26:367-374. [Google Scholar].
42. Trujillo J, Chirino YI, Molina-Jijón E, Andérica-Romero AC, Tapia E, Pedraza-Chaverrí J. Renoprotective effect of the antioxidant curcumin: Recent findings. *Redox Biol.*,2013;1:448-56.
43. Parthasarathy V, Chempakam B, Zachariah T. *Chemistry of Spices*. Wallingford, UK: CABI Pub., 2008.
44. Liju VB, Jeena K, Kuttan R. An evaluation of antioxidant, anti-inflammatory, and antinociceptive activities of essential oil from *Curcuma longa*. *L. Indian J Pharmacol*,2011;43:526-31.
45. Gupta SC, Prasad S, Kim JH, Patchva S, Webb LJ, Priyadarsini IK, *et al.* Multi targetting by curcumin as revealed by molecular interaction studies. *Nat Prod Rep.*,2011;28:1937-55.
46. Anand P, Kunnumakkara AB, Newman RA, Aggarwal BB. Bioavailability of curcumin: Problems and promises. *Mol Pharm*,2007;4:807-18. [PubMed] [Google Scholar]
47. Mukharjee PK, Neema KN, Maity N, Sarkar B. Phytochemical and therapeutic potential of cucumber. *Fitoterapia*,2013;84:227-36.
48. Pastorino G, Cornara L, Soares S, Rodrigues F, Oliveira M. Licorice (*Glycyrrhiza glabra*): A phytochemical and pharmacological review. *Phytother. Res.*,2018;32:2323-2339. [CrossRef]
49. Vanitha M, Soundhari C. Isolation and characterisation of mushroom tyrosinase and screening of herbal extracts for anti-tyrosinase activity. *Int. J. Chem. Tech. Res.*,2017;10:1156-1167.
50. Hooda R. Antiwrinkle herbal drugs-An update. *J. Pharmacogn. Phytochem*,2015;4:277-281.
51. Utami SM, Djajadisastara J, Saputri FC. Using hair growth activity, physical stability, and safety tests to study hair tonics containing ethanol extract of licorice (*Glycyrrhiza glabra* Linn.). *Int. J. Appl. Pharm.*,2017;9:44-48. [CrossRef].
52. Arunaksharan Narayanankutty, Krishnaprasad Kunnath, Bobby Jose, Varsha Ramesh, Rajakrishnan Rajagopal, Ahmed Alfarhan, *et al.* Analysis of the chemical composition of root essential oil from Indian sarsaparilla (*Hemidesmus indicus*) and its application as an ecofriendly insecticide and pharmacological agent. *Saudi Journal of Biological Sciences*,2021;28(12):7248-7252.
53. Ravishankara MN, Shrivastava N, Rajani M. Evaluation of antioxidant properties of root bark of *Hemidesmus indicus* R.Br. (Anantmul). *Phytomedicine. International Journal of Phytotherapy and Phyto Pharmacology*,2002;9(2):153-160.
54. Alam MN, Bristi NJ, Rafiquzzaman M. Review on *in vivo* and *in vitro* methods evaluation of antioxidant activity. *Saudi Pharm J.*,2013;21:143-152. Crossref, Medline, Google Scholar.
55. Melaleuca alternifolia (Tea Tree) Oil: a Review of Antimicrobial and Other Medicinal Properties by C. F. Carson, K. A. Hammer, and T. V. Riley published in *Clinical Microbiology Reviews* by the American Society For Microbiology.
56. isignano G, Tomaino A, Cascio RL, Crisafi G, Uccella N, Saija A. On the *in vitro* antimicrobial activity of oleuropein and hydroxytyrosol. *J. Pharm. Pharmacol*,1999;51:971-974. [Google Scholar] [CrossRef] [PubMed].
57. Capasso R, Evidente A, Schivo L, Orru G, Marcialis MA, Cristinzio G. Antibacterial polyphenols from olive oil mill waste waters. *J. Appl. Bacteriol*,1995;79:393-398. [Google Scholar] [CrossRef] [PubMed]
58. Bayles B, Usatine R. Evening primrose oil. *Am Fam Physician*,2009;80:1405-8.
59. Azzi A. Tocopherols, tocotrienols and tocomonoenols: Many similar molecules but only one vitamin E. *Redox Biol.*,2019;26:101259.
60. Lio P. Rapid improvement and protective effects of an almond oil-based ointment for diaper dermatitis. *J Drugs Dermatol*,2016;15:s86-90.
61. De Oliveira AP, Franco Ede S, Rodrigues Barreto R, Cordeiro DP, de Melo RG, de Aquino CM, *et al.* Effect of semisolid formulation of persea americana mill (avocado) oil on wound healing in rats. *Evid. Based Complement. Alternat. Med.*, 2013, 472382. [CrossRef] [PubMed]
62. Patzelt A, Lademann J, Richter H, Darvin ME, Schanzer S, Thiede G, *et al.* *In vivo* investigations on the penetration of various oils and their influence on the skin barrier. *Skin Res. Technol*,2012;18:364-369. [CrossRef] [PubMed].
63. Martin R, Pierrard C, Lejeune F, Hilaire P, Breton L, Bernerd F. Photoprotective effect of a water-soluble extract of *Rosmarinus officinalis* L. against UV-induced matrix metalloproteinase-1 in human dermal fibroblasts and reconstructed skin. *Eur J Dermatol*,2008;18:128-35. [PubMed] [Google Scholar].
64. Fu Y, Zu Y, Chen L, Efferth T, Liang H, Liu Z, *et al.* Investigation of antibacterial activity of rosemary essential oil against *Propionibacterium acnes* with atomic force microscopy. *Planta Med.*,2007;73:1275-80. [PubMed] [Google Scholar]
65. tokawa H, Qiao Y, Takeya K. Anthraquinones and naphthohydroquinone from *Rubiocordifolia*. *Phytochemistry*,1989;28(12):3465-3468.
66. Sawhney R, Berry V, Kumar A. Inhibitory activity of *Rubiocordifolia* plant extract against ESBL producing urinary *E. coli* isolates. *Journal of Pharmacy Research*,2012;5(3):1328-1330.
67. Zhou LL, Lin ZX, Fung KP, Che CT, Zhao M, Cheng CHK, *et al.* Ethyl acetate fraction of *Radix rubiae* inhibits cell growth and promotes terminal differentiation in cultured human keratinocytes. *Journal of Ethnopharmacology*,2012;142:241-247.

68. Prajapati SN, Parmar KA. Anti-viral and in-vitro free radical scavenging activity of leaves of *Rubiacordifolia*. *International Journal of Phytomedicine*,2011;3:98-107.
69. Priya DM, Siril EA. Traditional and Modern Use of Indian Madder (*Rubia cordifolia* L.): An Overview. *International Journal of Pharmaceutical Sciences Review and Research*,2014;25(1):154-160.
70. Mokhtari C, Malek F, Manseri A, Caillol S, Negrell C. Reactive jojoba and castor oils-based cyclic carbonates for biobased polyhydroxyurethanes. *Eur Polym J*,2019;113:18-28. DOI 10.1016/j.eurpolymj.2019.01.039.
71. El-Mallah MH, El-Shami SM. Investigation of liquid wax components of Egyptian jojoba seeds. *J Oleo Sci.*,2009;58(11):543-548. DOI 10.5650/jos.58.543.
72. Pooja Umaiyal M, Gayathri R, Vishnupriya V, Geetha RV. Antimicrobial activity of jojoba oil against selected microbes: An invitro study. *J Pharm Sci Res.*,2016;8(6):528.
73. Kahremany S, Babaev I, Gvirtz R, Ogen-Stern N, Azoulay-Ginsburg S, Senderowitz H, Cohen G, Gruzman A. Nrf2 Activation by sk-119 Attenuates Oxidative Stress, uvb, and Ips-Induced Damage. *Skin Pharmacol Physiol.*, 2019;32(4):173-181. DOI 10.1159/000499432.
74. Meyer J, Marshall B, Gacula M, Rheins L. Evaluation of additive effects of hydrolyzed jojoba (*Simmondsia chinensis*) esters and glycerol: A preliminary study. *J Cosmet Dermatol*,2008;7(4):268-274. DOI 10.1111/j.1473-2165.2008.00405. x