
Natural Herbs and Spices: A Great Resource for Skin Care Cosmetics

Ferdoushi Jahan^{1,*}, Afroza Akter Happy¹, Mohammad Moynul Hasan Chowdhury²,
Mohammad Arif Hossain¹

¹Bangladesh Council of Scientific and Industrial Research (Bcsir), Dhaka, Bangladesh

²National Academy for Planning and Development, Dhaka, Bangladesh

Email address:

ferdoushi.bcsir@gmail.com (F. Jahan), aahappy025@gmail.com (A. A. Happy), moynulhasan2005@gmail.com (M. M. H. Chowdhury), arif.acce2610@gmail.com (M. A. Hossain)

*Corresponding author

To cite this article:

Ferdoushi Jahan, Afroza Akter Happy, Mohammad Moynul Hasan Chowdhury, Mohammad Arif Hossain. Natural Herbs and Spices: A Great Resource for Skin Care Cosmetics. *Journal of Plant Sciences*. Vol. 7, No. 4, 2019, pp. 86-99. doi: 10.11648/j.jps.20190704.13

Received: July 30, 2019; **Accepted:** August 22, 2019; **Published:** September 16, 2019

Abstract: Nature is recognized as the most valuable blessing to the human being, since all one needed to exist in this universe are provided in nature. Hence, from the ancient time, human beings used typical natural ingredients for their daily requirements such as medicines as well as cosmetics. Nowadays men and women are very much willing to look them beautiful. Further they are very much conscious about their physical as well as mental fitness i.e. people like to live healthy. Skin is the largest organ of human body. Hence, these conscious people show much interest on skin care activities. They have a tendency to use beauty products that includes herbs to look younger and more charming. Cosmetics alone are not sufficient for proper skin care, so the addition of active ingredients is necessary to check the damage and ageing of the skin. Recently, herbal cosmetics have gained more popularity and more acceptability among the people than synthetic ones due to their lesser or almost nil side effects. In some cases, synthetic cosmetic products may cause severe damage to human skin as those products may contain harmful chemicals. Natural ingredients like herbs, fruits, flowers, barks, rhizomes, leaves, seeds, spices etc. have been used by both men and women over the whole world and these ingredients are recognized as the best according to their choice. For this reason, at present times, in skin care cosmetic preparations, these natural ingredients are included directly or their extracts and essential oils are used randomly. In this current article, effective skin care properties of some indigenous herbs and spices of Bangladesh are discussed.

Keywords: Herbs, Spices, Skin Care, Herbal Cosmetics

1. Introduction

The word 'cosmetic' was derived from the Greek word "kosm tikos" meaning having the power, arrange, skill in decorating [1]. Herbal cosmetics are referred as the products which are formulated using various permissible cosmetic ingredients in order to form the base in which one or more herbal ingredients are added to provide defined cosmetic benefits only, shall be called as "Herbal Cosmetics" [2]. Herbal cosmetics are also known as "natural cosmetics". With the beginning of the civilization, mankind is concerned about the concept of beauty and cosmetics. Natural ingredients have been used for centuries for skin care

purposes. The most widely used ingredients are herbs which are actually plants or plants extract, including leaves, bark, berries, roots, rhizomes, seeds, stems, fruits and flowers which are enriched with nourishing and healing elements. Herbal materials include, in addition to herbs, fresh juices, gums, fixed oils, essential oils, resins and dry powders of herbs. Herbal cosmetics are known as the products in which herbs are used in crude or extract form [3].

The most common skin problems are dryness, eczema, acne, dullness, wrinkles, pimples, ageing, bad spot etc. These skin damages are caused by numerous chemical toxins, microorganisms, chemicals, environmental pollution, infections present in atmosphere. Cosmetics alone cannot take care of skin and other body parts, the association of

active ingredients are highly required to fight against the damage and ageing of the skin. Nowadays, these active natural ingredients have become more prevalent in cosmetic preparations due to consumers' concerns about synthetic products which are enriched with chemical substances. The main benefits of addition of herbal extracts into the skin care formulations include antioxidant, anti-inflammatory, antiseptic and antimicrobial activities.

The demand of herbal cosmetics is increasing rapidly because of their lack of side effects [4]. The best thing of the herbal cosmetics is that it is originally made by the extracts of herbs and shrubs. The natural content in the herbs does not show any side effect on the human body; rather they enrich the body with nutrients and other useful minerals and thus enhance the beauty and provide satisfaction.

2. Different Herbs and Spices Used in Skin Care

Coconut Oil

Coconut oil is obtained by crushing copra, the dried kernel, from which about 60-65% of the oil is found. It contains a high amount of glycerides of lower chain fatty acids. Coconut oil is derived from the fruit or seed of the coconut palm tree *Cocos nucifera*, family Arecaceae. The melting point of coconut oil is 24 to 25°C (75-76°F), as a result, it can be used easily in both liquid and solid forms and is often used in cooking and baking [5]. Coconut oil has the property of being an excellent skin moisturizer as well as softener [6]. A study shows that extra virgin coconut oil is effective and safe when used as a moisturizer, without any adverse reaction. It is also helpful for skin itching and rashes [7]. The oil from the nuts is valued as an emollient and used as an ingredient for remedies of skin infections. Coconut oil was used formerly as the main ingredient in marine soaps because coconut oil soap was, unlike other soaps, not readily precipitated by salt solutions. However, due to its alkali laurate content some coconut oil soaps can cause irritation to the skin [8].

Sunflower Oil

It is the non-volatile oil produced from sunflower seeds found from *Helianthus annuus*, under Asteraceae family. Sunflower oil provides lecithin, tocopherols, carotenoids and waxes. In cosmetics, because of having smoothing properties, it is considered noncomedogenic [6, 9-10]. As simple and cost-effective, this oil is being tried and tested in a wide variety of formulations of emulsions for face and body Products [11-12]. Sunflower oil contains polyunsaturated fats, high in triglycerides of linoleic acid, an essential fatty acid necessary for the body to maintain good skin condition. Studies show that cutaneous application of the sunflower oil increases the linoleic acid levels of the skin, decreases transepidermal water loss and thus helps to eliminate scaly lesions common in patients with essential fatty acid deficiency. It can be used for psoriasis and on bruises [13]. A new sunflower hybrid oil, having excellent oxidative stability

and with a high percentage of oleic acid, can be effective as a natural and functional raw material in cosmetic formulations [14].

Olive Oil

Olive oil is extracted from the fruits of *olea europaea*, family oleaceae. The main components are triolein, tripalmitin, trilinolein, tristearate, monosterate, triarachidin, squalene, β -sitosterol and tocopherol. It is used as skin and hair conditioner in cosmetics like lotions, shampoos etc. It is a good fatty acid penetration enhancer [15]. Earlier, people have used this fruit and oil; the ancient Greeks used to bathe with olive oil. It has become useful to moisturize dry skin, and as a lip balm, shampoo, soap, hand lotion, massage oil and dandruff treatment [16]. The extracts obtained from the mixtures of olive fruits, leaves and stems have anti-inflammatory and active oxygen scavenging effects [17]. The anti-inflammatory effect is due to both unsaponifiable and polar compounds [18], while the free radical-scavenging effect of virgin olive oil is for the presence of polyphenols [19-20]. It is very useful to treat skin damage, such as contact dermatitis (particularly diaper area dermatitis), atopic dermatitis, xerosis, eczema (including severe hand and foot eczema), rosacea, seborrhoea, psoriasis, thermal and radiation burns, other types of skin inflammation and aging [20]. When the oil is used topically after UVB exposure, it can effectively lessen UVB-induced skin tumours through its antioxidant effects [21]. Adverse cutaneous reactions due to topically applied olive oil are seldom reported, but olive oil is generally very weak irritant [22].



Figure 1. Coconut Fruit.



Figure 2. Sunflower.



Figure 3. Olive fruit.

Jojoba Oil

Jojoba oil is a mixture of long chain, linear liquid wax esters expressed from the peanut-sized seeds of the desert shrub *simmondsia chinensis*, family simmondsiaceae. It is very easy to remove any odor and color from jojoba oil as it is oxidatively stable. It is often used in cosmetics as a moisturizer and also as a carrier oil for its exotic fragrances. Jojoba oil gives a broad spectrum of fatty acids such as oleic, linoleic, linolenic and arachidonic, as well as triglycerides which are greatly compatible with human skin sebum [23 - 24]. Sebum helps to protect as well as moisturize the skin and hair but is stripped away by chemicals, pollutants, sun and the aging process, which results in dry skin and hair. Jojoba oil replenishes what skin and hair lose and restores them to their natural pH balance [15]. It is a rich extract used in cosmetic formulations, not only acting as a humectant, but creating a protective film over the skin that keeps in moisture [13]. Jojoba oils and hydrogenated jojoba oils can be effective in the preparation of future skin care products [25], as in the formulation of creams, lotions, soaps, lipsticks and other preparations designed to be spread onto the skin or hair; as it is an effective, non-greasy lubricant. Screening of the oil proved that it has significant analgesic, antipyretic, anti-inflammatory, antioxidant, antibacterial and anti parasitic properties [16, 23].

Aloe vera

Aloe vera is a herbal plant species, which belongs to liliaceae family, produced only by cultivation since it has no naturally occurring populations, although closely related aloes are found in northern Africa [26]. It is very common in many cosmetics as it is capable to heal, moisturize and soften skin. Usually the aloe vera leaves are cut in order to extract its soothing gel [6]. Aloe vera contains amino acids like leucine, isoleucine, saponin glycosides which give cleansing action, vitamins A, C, E, B, choline, B12 and folic acid responsible for antioxidant activity [27-28]. For having the properties to prevent aging and regenerate growth of cells, it was used as an essential ingredient to keep oneself fit and protect the skin [29], it also prevents and heals skin irritations [5]. Aloe vera maintains flexibility of skin and cures wound and burns [30]. Its gel has been used as a good remedy for severe burns, ulcers, excoriation and all kinds of skin irritations. It is used for pain relief and healing of 'hemorrhoids, can be applied externally and internally, It's also used in case of sunburn, scratch and as a cleansing element for the body or skin. It is helpful for growing new tissue and causes the alleviation of skin cancer caused by the sun [31]. In addition to this, aloe vera is known as anti-aging agent [131-132]. Therefore, aloe vera can be used in moisturizers, lotions, creams, hair tonic, shaving creams, etc.

Neem

The herb, neem (*Azadirachta indica*), belonging to the family Meliaceae, has been considered "Sarva Roga Nivarini: the curer of all ailments". Its role as a potential drug is realized as far back as 4500 years ago. Some of its health restoring benefits are as effective in skin infection, rashes and pimples, beauty enhancer, immunity booster, anti obesity,

blood purifier for beautiful and healthy skin, anti viral, anti diabetic, dispels intestinal worms and parasites, piles, malaria, hair disorder and oral disorders [31]. Several parts of this plant are used in case of skin ulcers and wounds regeneration because of its provoking ability of revascularization [32].



Figure 4. Jojoba fruit.



Figure 5. Aloe vera.



Figure 6. Neem leaf.

Turmeric

Turmeric comes from the underground stems of the tropical perennial herb *Curcuma longa* of the family *Zingiberaceae* which is deep yellow-to-orange in colour [33]. It contains a wide range of phytochemicals, such as demethoxycurcumin, bisdemethoxycurcumin, zingiberene, curcumol, curcumenol, eugenol, tetrahydrocurcumin, triethylcurcumin, curcumin, turmerin, turmerones, and turmeronols. Curcumin gives the yellow color to turmeric and is responsible for most of the therapeutic effects [34]. Turmeric has antiseptic, analgesic, anti-inflammatory, antioxidant, antimalarial, insect-repellent etc. properties [35-38]. Turmeric provides a great variety of pharmacological activities due to curcumin, such as antibacterial, antiparasitic, anti-HIV (human immunodeficiency virus effects) [39-40]. It shows a good potential as a wound healing agent when applied externally to septic and aseptic wounds [41], due to anticarcinogenic [42-45], antioxidant and inhibition of lipid peroxidation [41, 46-49] and anti-inflammatory properties with few toxic effects [50]. It is also effective for prevention, treatment or control of psoriasis and other skin conditions such as acne, wounds, burns, eczema, sun damage to the skin

and premature aging, since it inhibits the activity of phosphorylase kinase [8]. In Ayurvedic medicine, turmeric is efficient for the treatment of sprains and swellings caused by injury [51]. Turmeric powder is also helpful to treat skin ulcers and to heal extensive skin eruptions [52, 53]. Turmeric rhizome powder has anti-inflammatory and anti-oxidant properties, hence it is used for preparation of facial creams and ointments [54].

Cucumber

Cucumber or *Cucumis sativa* Linn, under the family of Cucurbitaceae, has cooling, healing and soothing properties mostly to irritated skin caused by sun or the effects of a cutaneous eruption. In cosmetics, for the treatment of hyperpigmentation, both cucumber extract and lemon extract are used. These two ingredients do not interfere with each other; rather they provide better lightening capabilities [8]. Peeled pericarp of cucumber gives antioxidant enzymes and superoxide dismutase [8], but peroxidase (I) activity of fresh cucumber fruit is highest in the skin, followed by pericarp and then carpel tissues [55]. It is mostly effective in case of dermal problems and so its fruits and seeds are frequently used in many skin care products as anti-wrinkle and anti-inflammatory agents in order to retain the flexibility of skin. It can be added in skin lotion for enhancing and maintaining skin tone by preventing tyrosinase activity. Its extract has become a great source for better blood circulation to skin [1, 56]. Cucumber provides some vitamins and minerals which are essential for a healthy looking skin. Its peel extract is very much effective to skin care products for its toning and skin tightening properties, while the fruit and seed extract can protect skin from sunburn [57].

Calendula

In spite of having some similarities, *Calendula officinalis* should not be confused with the very common plant named as marigold, such as those in the genus *Tagetes* [5]. A number of cosmetic preparations are made from *Calendula officinalis*, including the extract of the whole plant, the flowers (flower extract and flower oil) and the seed oil [58]. Among the ingredients found from calendula, the flower extracts are mostly used for cosmetics and personal care products. It possesses a remarkable antioxidant activity, anti-inflammatory activity and wound healing activity [59]. The essential oil of *Calendula* mainly provides α -thujene, α -pinene, 1, 8-Cineole, dihydrotagetone and T-muurolol [60]. *Calendula officinalis* can be used topically to treat acne, reduce inflammation, control bleeding and for soothing irritated tissue [6]. The cream or ointment made from it is approximately effective in treating radiation dermatitis [61- 63]. A random study including 254 radiation patients has been reported that topical application of 4% calendula ointment resulted in far fewer occurrences of Grade 2 or higher dermatitis than occurred in the group using trolamine. Those who used calendula also experienced less radiation-induced pain and fewer breaks in treatment [64].



Figure 7. Turmeric rhizome.

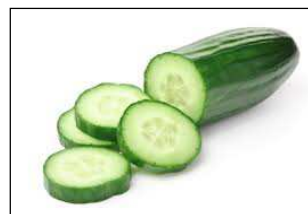


Figure 8. Cucumber.



Figure 9. Calendula.

Carrot

Carrot, found from the plant *Daucus carota* under the family of Apiaceae, is considered valuable since ages due to its richness in vitamin A along with other essential vitamins. Carrot seed oil has anti-aging, revitalizing and rejuvenating properties [5, 6]. As it helps in promoting new cells formation as well as reducing wrinkles, it can be used as a natural toner and rejuvenator for the skin. The characteristic bright orange colour of carrot comes from β -carotene, and lesser amounts of α -carotene and γ -carotene. Both α and β -carotenes are partly metabolized into vitamin A in humans [65].

Green Tea

For thousands of years, tea plant has been cultivated in Asia [66]. Green tea is one kind of tea made only with the leaves of *Camellia sinensis* under the family Theaceae [6]. Green tea is an excellent skin protectant and can be applied externally or consumed as a beverage or dietary supplement [5]. It gives protection against direct damage to the cell and moderates inflammation. Studies showed that the catechins found in green tea are almost 20 times stronger in their antioxidant powers than even vitamin E [5]. The main ingredients of green tea are the polyphenols and catechins are the most vital polyphenols in green tea; flavandiol, phenolic acids and flavonols are also available. Green tea has powerful antioxidant properties [67 - 71], also it has the ability to cure UV photo-damage and phototoxicity [67, 72 - 74]. It is effective for the prophylaxis of dry skin conditions as it stimulates the formation of ceramides and sphingolipids in the skin and thus reinforces the lipid barrier [75], and its anti-inflammatory and anticarcinogenic potential can be helpful against a variety of skin disorders [76]. There are four major

polyphenolic catechins found in green tea leaves; these are (2)-epicatechin (EC), EGC, (2)-EC-3-gallate, and EGCG, which is the most abundant [77]. Studies showed that green tea extracts or an individual green tea polyphenol (GTPP), especially epigallocatechin (EGC)-3-gallate (EGCG), inhibited two-stage chemical carcinogenesis (*e.g.*, induced by 7, 12-di-methylbenz (a)anthracene [DMBA] and 12-O-tetra decanoylphorbol 13-acetate [TPA]) and photo-carcinogenesis (induced by UVB) [78].

Multani Mitts (Fullers Earth)

It is known as Mother Nature's own baby powder [5]. Clay was one of the earliest ingredients that was randomly used as a beauty mask in order to remove oils from the skin, natural moisturizers for hairs, teeth, gums and hair. It is very much useful for removing pimple marks as well as treating sunburn; it helps to unclog pores and cleanse the skin of flakes and dirt [31].



Figure 10. Carrot.



Figure 11. Green Tea leaf.



Figure 12. Multani Mitts.

Papaya

Papaya or *Carica Papaya* belongs to the Caricaceae Family. It provides variety of health and skin benefits. Decoction of its bark is effective in cases of worms, intestinal parasites, hemorrhages, constipation, skin rashes, cuts, malaria, liver and spleen disorders. Decoction of the flowers is useful as a heart tonic and as an emmenagogue. The papaya fruit is used in helminthiasis, dyspepsia, abortion and

gonorrhoea, as galactagogue and can also be externally applied in eczema, psoriasis and ulcers [79]. The main constituents of *Carica Papaya* are papain, chymopapain, carpain, carpasemine and benzyl isothiocyanate [80]. Milky juice of unripe fruit is considered as a good ingredient for facial and face cream; fruit pulps are used to make skin soft and remove blemishes [81].

Lemon

The common name of lemon (*Citrus limon*) is nimbu and it belongs to the family of Rutaceae. The major components obtained from lemon are limonene, β -myrcene and decanal [82]. It is a great source of vitamin C; its oil is widely used in various cosmetic preparations in order to reduce skin itching and also for skin nourishment; pulp left after extraction of juice is known as a good facial ingredient [83]. Lemon essential oil, produced from lemon peel, has strong antibacterial properties and hence is capable of reducing even fatally dangerous bacteria strains. It can be used to reduce acne breakouts caused by high levels of bacteria stuck in pores [84]. It is also effective for fading scars and age spots, can exfoliate skin, brighten and lighten skin, tone oily skin and fight against wrinkles. Lemon essential oil nourishes damaged skin and hydrates the skin. It is also able to lessen cell and tissue damage in the skin caused by free radicals due to its strong antioxidant activity and anti-aging effects [85].

Garlic

Garlic comes from the herb *Allium sativum* under the family of Alliaceae. Its chemical constituents are Llicin, phytoncidea, alliin, ajoene, isoalliin, methiin etc. The main component in raw garlic is alliin; when fresh garlic is chopped or crushed, the enzyme alliinase converts alliin into allicin. Garlic has antibacterial, antifungal, antiviral, and antiseptic properties because of allicin [86]. Allicin helps to kill the bacteria that causes acne. It also helps to reduce swelling and inflammation and increases blood circulation. Garlic also has thiosulfates, which act as an antimicrobial agent. With regular use, it clears the skin. Garlic has potential effects on several medical conditions like cancer, psoriasis and wound healing [87]. Some studies [88] have shown that garlic possesses anti-inflammatory properties. These properties are proved for reducing the inflammation of acne. Garlic oil is useful to control sores, pimples and acne. That's why it can be frequently used in skin lotions and creams [89].



Figure 13. Papaya fruit.



Figure 14. Lemon.



Figure 15. Garlic.

Grape Seed

The seeds of *Vitis vinifera L.* under the family of Vitaceae have polyphenolic proanthocyanidins which can naturally bind with each other to form oligomers known as procyanidins. These procyanidins are antioxidants in nature and considered more powerful than vitamin C and E in case of inhibition of lipid peroxidation [90 - 92]. Proanthocyanidins are a subtype of flavonoids and their antioxidant properties are responsible for wound curing [93]. Grape seed extracts provide tyrosinase-inhibiting activity and thus are effective in anti-aging and skin-lightening cosmetics preparations [94 - 95]. It also protects the elasticity of the skin, so the texture becomes soft and smooth. Hence it can be used in many facial creams [96].

Oat

Oat, a species of cereal grain, is obtained from *Avena sativa* that is grown for its seed. It is not only consumed for nutritional purposes, but it also has healing and soothing properties. Oat oil is rich in antioxidants, essential fatty acids and natural emollients [97]. It is frequently used in many lotions, creams, facial oils, salves and balms due to its unique benefits. It helps to protect and repair the skin from environmental adverse effects such as UVA/UVB irradiation, pollution, smoke, bacteria and free radicals and thus lowers discomfort, irritation and inflammation of the skin. It also helps to repair damage caused by other chemicals such as AHA (alpha-hydroxy acids), surfactants and bleaches [98]. Oatmeal can be used in cosmetics such as in facial masks, facial scrubs, soap-free skin cleansers and also as an additive in bath soaps to cure irritation or itching. It is considered suitable for the treatment of geriatric dermatosis, eczema and sunburn due to its hypoallergenic properties [99].

Chameli

The botanical name of chameli is *Jasminum grandiflorum* which belongs to the family of Oleaceae. The major constituents of this flower are Secoiridoid glucosides, 2"-epifraxamoside, demethyl-2"- epifraxamoside, secoiridoid and jasminanhydride. Essential oil extracted from flower can

be used in skin creams and lotions to reduce skin diseases. Also essential oil extracted from plant is helpful for the protection from sunburn [100-101].



Figure 16. Grape fruit and seed.



Figure 17. Oat.



Figure 18. Chameli flower.

Chandan

It is obtained from the plant *Santalum album* under Santalaceae family. The main constituents of it are Alpha and beta-santalol, cedrol, esters, aldehydes, phytosterols, squalene etc. From early ages, it was popular as scrubs and face packs in order to remove dead cells and also to regenerate growth of new cells and thus give a younger look [5]. Chandan has good anti-oxidant properties; hence the paste of its hardwood is used in face pack and essential oil of it is greatly used in creams, ointments and lotions for skin beautification and also to protect from sunburn [103 - 105].

Til

Til (*Sesamum indicum*, family of Pedaliaceae) provides some useful components such as Latifonin, momor-cerebroside, soya- cerebroside II, beta-sitosterol, daucosterol, D-galacititol etc. Its seed extract is helpful for skin protection and rejuvenation.

Tulsi

It is found from the plant *Ocimum sanctum* which belongs to the family of Lamiaceae. The major components it gives are Eugenol, epi- α -cadinol, α - bergamotene and γ -cadinene. Leaves extract of tulsi can be used to reduce skin infection and is good for rejuvenation.



Figure 19. Chandan.



Figure 20. Til.



Figure 21. Tulsi leaves.

Water lettuce

Water lettuce (*Pistia stratiotes*) belongs to the family of Araceae. It provides palmitic acids, anthocyanin-cynidin-3-glucoside, luteolin-7-glycosid, vitexin, orientin etc. Leaves extract of it can be much effective in case of chronic skin disorders.

Mango

The most common edible fruit, *Mangifera indica* (Anacardiaceae), contains kernels from which a valuable emollient oil is obtained and this oil is rich in oleic, stearic acids and triglycerides; therefore it can be used in cosmetics [8]. Mango kernel oil has been checked for its acceptability as an ointment base, and has been found to release drugs at a remarkably higher rate than the standard paraffin-base ointment formulation. The unripe mango fruit is effective for healing wide variety of skin eruptions, ranging from leprosy and sores to boils [8]. It consists of mangiferin, isomangiferin, tannins, gallic acid protocatechic acid, catechin, mangiferin, alanine, glycine, γ -aminobutyric acid, kinic acid, shikimic acid etc. Plant extract of mango has anti-oxidant properties.

Pea

Pea (*Pisum sativum*), belonging to the family of Leguminosae, has been used for the treatment of acne. The

seeds contain proteins, lecithins, carbohydrates, fats and salts. These have nutritive and antidermatosis properties and hence have effects on many types of skin problems, for

example face masks prepared from crushed peas are useful in cases of acne and on wrinkled skins.



Figure 22. Water lettuce.



Figure 23. Mango.

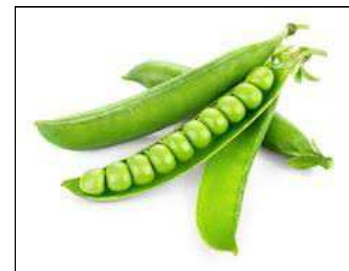


Figure 24. Pea.

Pumpkin

Fatty acids separated from *Cucurbita pepo* (Cucurbitaceae) seed oil, have good anti-inflammatory properties and so have been used in medicine. Among these acids, linoleic acid is main, also oleic, palmitic and stearic acid are included [115 – 116]. Pumpkin seed oil is effective in the cases of herpes lesions, venereal sores, acne vulgaris and stubborn leg ulcers which usually refuse to heal up. Pumpkin leaves can also be used as a poultice on sprains and pulled ligaments. An infusion made from the roots of pumpkin is used on syphilitic sores, herpes lesions, pimples and blackheads.

Onion

The common red onion, *Allium cepa* (Liliaceae), has some beneficial effects when it is applied externally as a poultice for acne, boils, abscesses and blackheads to draw out the infection and thus it helps to decrease inflammation and increase healing. Studies showed that onions possess antiallergic and anti-inflammatory properties because of the flavonoids e.g. quercetin and kampferol [118 – 122], and in addition, onion juice has antimicrobial [119, 123] and antifungal effects. Onion juice can be applied to burns and scalds in order to prevent blistering and infection; and also the skin of the onion can be used as dressing on facial and body sores.

Fenugreek

Trigonella foenum-graeceum L. (Fabaceae) is a fragrant herb; its seeds have gained popularity for medicinal and culinary purposes all through the ages by Egyptians, Greeks, Romans and among others. The seeds provide antioxidant effects, and contain mucilage which has emollient properties. This herb is significantly used for wound healing, skin irritation, itching and dermal cancer.



Figure 25. Pumpkin.



Figure 26. Onion.



Figure 27. Fenugreek.

Vasaca

Adhatoda vasica (Acanthaceae) is a medicinal herb; it contains some important chemical constituents such as vasicine, vasicine acetate, 2-acetyl benzyl amine, vasicinone, quinazoline. Fresh leaves juice or extract of vasaca is useful for skin affection and helps to control scabies.

Clove

Clove (*Syzygium aromaticum*) has strong antibacterial properties and its active antibacterial ingredient is eugenol, which is effective in keeping the skin surface free of dirt, grime, and harmful bacteria, which may lead to breakouts. It shows also anti-inflammatory properties; hence clove oil can reduce redness and swelling associated with acne. As cloves have such a strong fragrance and flavor, it is best to use topically to the surface of the skin.

Rose

Rose (*Rosa* spp.) is the most common and popular flower in Asia. It can be helpful in its every form for delightful, luxurious skin. It contains anti-inflammatory and antibacterial compounds (effective for oily and acne-prone

skin); it has anti-aging properties and is considered to nourish, hydrate, and even help tone and rejuvenate the skin. Rose petals, rose hydrosol, rosehip seed oil, rose flower essence, and precious rose essential oil are all derived from this one generous plant. Rose extracts are one of the best anti-inflammatory and scar reducing ingredients; they reduce redness and calm the skin. They are rich in vitamin C, so they can stimulate collagen and are high in vitamin E, so are very moisturizing in nature and help the skin to protect against pollution. Rose extracts and rose essential oil thus can be utilized in cosmetic preparations.



Figure 28. Vasaca leaf.



Figure 29. Clove buds.



Figure 30. Rose.

Strawberry

Strawberries are known as super fruits, enriched with powerful anti-oxidants and loads of vitamin C that provide nourishing nutrients for healthy happy skin. The major anti-oxidant strawberries contain is ellagic acid which prevents collagen destruction and thus protect the skin from wrinkle formation. Ellagic acid has a photoprotective effect that works against UV damage; it is also very much efficient in lightening blemishes, acne scars and other dark spots. Strawberry can remove excess oil from the skin due to having a high content of salicylic acid; hence it is recognized as the ideal agent to protect the skin from acne. Being rich in alpha- hydroxylic acid, strawberries help get rid of dead skin cells and give supple look of skin. In skin care cosmetics like

facemasks, facewashes and creams, strawberry extracts are randomly used.

Banana

Banana, the most available and common fruit, provides so many beauty benefits to skin. It is enriched with powerful anti-oxidants, phyto-chemicals and moisture. This fruit helps nourish and revitalize dry skin as well as smoothen rough and aging skin. It is helpful for acne-prone oily skin; exfoliates excess oil and sebum from skin surface and prevents further breakouts of acne. It acts as skin moisturizer because of its high potassium and moisture content; hence it hydrates and moisturizes dry skin and makes it soft and supple. It also contains vitamins E and C which help to get clear glowing skin. Banana possesses super wrinkle fighting nutrients which helps lighten age spots, acne scars, dark spots and prevent fine lines and wrinkles. Like banana fruit, its peel is also excellent for treating acne and pimples, it can reduce inflammation and destroy bacteria.

Orange

The humble orange is a phenomenal fruit since it is full of ingredients e.g. natural oils and vitamins which are helpful for skin care and enhance the beauty. Natural oils in oranges help to moisturize skin, provide soft, healthy and supple skin for longer. Antioxidants found in oranges fight against free radicals which help to decrease the production of wrinkles and thus stop premature aging. Oranges possess a high content of citric acid which causes skin exfoliation and helps to dry out acne and thus improves the overall look of skin. Orange peel has a higher content of Vitamin C than the orange itself, so it may be more efficient for a healthy looking glow. Vitamin C helps to form collagen and elastin which will keep skin looking younger and more supple. Oranges can also prevent skin sagging and may improve firmness. Therefore orange fruit extracts as well as essential oil from orange peel can be utilized undoubtedly in cosmetic formulations such as facewash, bodywash, scrubber etc.



Figure 31. Strawberry.



Figure 32. Banana.



Figure 33. Orange.

Cinnamon

Cinnamomum verum, known as true cinnamon tree or Ceylon cinnamon tree, is a small evergreen tree belonging to the family Lauraceae. Its inner bark is cinnamon which is widely used as a spice. Cinnamon contains mostly polyphenols, powerful antioxidants which fight against free radicals. Study showed that cinnamon has more than 41 protective compounds that are highly beneficial. Cinnamon contains the most antioxidants among all spices. Along with polyphenols, cinnamon contains phenolic acid and other flavonoids. These nutrients in cinnamon are good for skin e.g. they can protect skin cells from free radical activity and also can increase skin glow. Due to anti-fungal, antioxidant and anti-bacterial properties, cinnamon has become more useful against acne and skin blemishes. It enhances blood flow to the surface of the skin and hence ensures moist skin. Cinnamon also has skin lightening properties; acne scars, blemishes, dark spots and marks can gradually be faded by using this. It can be used for the treatment of dry skin by removing dead skin cells and reinstate the softness of skin. Cinnamon provides the properties that could be effective in case of eczema. Cinnamon essential oil is good as massage oil. It improves blood circulation and thus enhances the tone of skin. Cinnamon oil from the leaves must only be applied onto the skin. Oil found using cinnamon bark usually causes allergic reactions.

Ginger

Ginger is a perennial herb that is obtained from the plant *Zingiber officinale* under the family of zingiberaceae. Ginger root or rhizome is widely used as spice and folk medicine. In addition to its medicinal value, ginger is used in skin care as well. It contains about 40 antioxidant compounds that fight against aging. It can improve the appearance of the skin by removing the toxins and stimulating the circulation. It maintains the elasticity and firmness of the skin and makes it more youthful. Because of its toning and antioxidant properties, ginger can reduce the hypopigmented scars (scars that are white or much lighter than skin tone) of skin and thus causes radiant and glowing skin. Ginger gives the properties which can relieve the pain and heal burnt skin by restoring it to the natural position. Having powerful antiseptic and cleansing agent, ginger keeps the skin clean, smooth and free of blemishes. It is also considered as the best natural acne-fighting ingredient since it lowers the rate of acne formation by killing the acne-causing bacteria. Hence ginger can be used in a number of commercial cosmetic preparations in order to smooth, nourish, tone and improve the overall skin health.

Peppermint

Mentha piperita, an aromatic herb under Lamiaceae family, is very much popular for its distinct aroma and medicinal value. Besides, peppermint is proved to be very effective in cosmetic preparations and the oil has more activity than the herb. The essential oil of peppermint herb is used frequently in skincare products such as face cream, scrubber, cleanser, facial mask etc. Peppermint oil is pale yellow in color and contains omega-3 fatty acids, iron, magnesium, calcium, Vitamins A and C, minerals, potassium, manganese and copper. It contains menthol, an organic compound having anesthetic properties that helps soothe discomfort and at the same time works to brighten up the dull skin and thus makes the skin healthy, smooth, fresh and radiant. Peppermint oil also has antiviral, antibacterial, anti-inflammatory, antispasmodic, and carminative properties. This is effective for treating acne; it can control the secretion of excess oil and prevent clogging of pores and outbreak of acne. Peppermint oil is able to create a sensation that can make someone feel energised and active; also it can promote better circulation, stimulate the skin and give it the youthful glow. It can be a good choice in case of skin irritation caused by rashes and sunburns.



Figure 34. Cinnamon.



Figure 35. Ginger rhizome.



Figure 36. Peppermint leaves.

3. Conclusion

Herbal cosmetics are as ancient as the beginning of human civilization. A lot of herbs as well as plants exist in our surrounding nature which possess great potential values for

cosmetic purposes. The present review focuses on some common and available natural herbs and spices of Bangladesh which are highly potent for skin care purposes. These can be randomly used with various skin care formulations e.g. facecream, facewash, facepack, scrub, body lotion, soap, body oil, cleanser etc. The advantages of herbal cosmetics are lower cost, side effects free, environmental friendly, safe to use etc. So they have a great future ahead as compared to the synthetic cosmetics. Hence, further research activities are highly needed for suitable process development with proper dose of optimization to get economical and side effect free skin care products. Due to the great availability of raw materials, significant growth in herbal cosmetic field will be easily possible in our country if proper regulations and other technical supports are provided by the authority. This will develop our national economy and also the people will be benefited with reliable skin care as well as dermatological products.

References

- [1] Shivanand, P., Nilam, M. and Viral, D., 2010. Herbs play an important role in the field of cosmetics. *International Journal of PharmTech Research*, 2 (1), pp. 632-639.
- [2] Glaser, D. A., 2004. Anti-aging products and cosmeceuticals. *Facial plastic surgery clinics of North America*, 12 (3), pp. 363-72.
- [3] Sahu, A. N., Jha, S. and Dubey, S. D., 2011. Formulation & Evaluation of curcuminoid based herbal face cream. *Indo-Global Journal of Pharmaceutical Sciences*, 1 (1), pp. 77-84.
- [4] Bouldin, A. S., Smith, M. C., Garner, D. D., Szeinbach, S. L., Frate, D. A. and Croom, E. M., 1999. Pharmacy and herbal medicine in the US. *Social science & medicine*, 49 (2), pp. 279-289.
- [5] Sumit, K., Vivek, S., Sujata, S. and Ashish, B., 2012. Herbal cosmetics: used for skin and hair. *Inven. J*, 2012, pp. 1-7.
- [6] Gediya, S. K., Mistry, R. B., Patel, U. K., Blessy, M. and Jain, H. N., 2011. Herbal plants: used as a cosmetics. *J. Nat. Prod. Plant Resour*, 1 (1), pp. 24-32.
- [7] Yong, J. W., Ge, L., Ng, Y. F. and Tan, S. N., 2009. The chemical composition and biological properties of coconut (*Cocos nucifera* L.) water. *Molecules*, 14 (12), pp. 5144-5164.
- [8] Aburjai, T. and Natsheh, F. M., 2003. Plants used in cosmetics. *Phytotherapy Research: An International Journal Devoted to Pharmacological and Toxicological Evaluation of Natural Product Derivatives*, 17 (9), pp. 987-1000.
- [9] Baydar, H., Özkan, G., Erbaş, S. and Altındal, D., 2007, April. Yield, chemical composition and antioxidant properties of extracts and essential oils of sage and rosemary depending on seasonal variations. In *1 International Medicinal and Aromatic Plants Conference on Culinary Herbs 826* (pp. 383-390).
- [10] Aslam, M. N., Lansky, E. P. and Varani, J., 2006. Pomegranate as a cosmeceutical source: pomegranate fractions promote proliferation and procollagen synthesis and inhibit matrix metalloproteinase-1 production in human skin cells. *Journal of ethnopharmacology*, 103 (3), pp. 311-318.

- [11] Athar, M. and Nasir, S. M., 2005. Taxonomic perspective of plant species yielding vegetable oils used in cosmetics and skin care products. *African journal of biotechnology*, 4 (1), pp. 36-44.
- [12] Tournas, J. A., Lin, F. H., Burch, J. A., Selim, M. A., Monteiro-Riviere, N. A., Zielinski, J. E. and Pinnell, S. R., 2006. Ubiquinone, idebenone, and kinetin provide ineffective photoprotection to skin when compared to a topical antioxidant combination of vitamins C and E with ferulic acid. *The Journal of investigative dermatology*, 126 (5), p. 1185.
- [13] Dweck, A. C., 1997. Skin treatment with plants of the Americas: Indigenous plants historically used to treat psoriasis, eczema, wounds and other conditions. *Cosmetics and toiletries*, 112 (10), pp. 47-66.
- [14] Brown, H. H., Arquette, J. D., Dwyer, K., Reinhard, J. and Roeding, J., 1993. A new sunflower-hybrid oil with excellent oxidative stability. *Seifen, Oele, Fette, Wachse*, 119, pp. 640-645.
- [15] Joshi, L. S. and Pawar, H. A., 2015. Herbal cosmetics and cosmeceuticals: An overview. *Nat Prod Chem Res*, 3 (2), p. 170.
- [16] Bruneton, J., 1999. *Pharmacognosy, Phytochemistry, Medicinal plants*, Lavoisier, Paris. ISBN 2-7430-0028-7.
- [17] Tehara, T. and Hachimaki, H., 2002. Antiallergic cosmetic or topical compositions containing olive extracts. *Jpn Kokai Tokkyo Koho*, 11, p. JP2002332238.
- [18] de la Puerta, R., Martínez-Domínguez, E. and Ruíz-Gutiérrez, V., 2000. Effect of minor components of virgin olive oil on topical antiinflammatory assays. *Zeitschrift für Naturforschung C*, 55 (9-10), pp. 814-819.
- [19] Manna, C., Della Ragione, F., Cucciolla, V., Borriello, A., D'Angelo, S., Galletti, P. and Zappia, V., 1999. Biological effects of hydroxytyrosol, a polyphenol from olive oil endowed with antioxidant activity. In *Advances in Nutrition and Cancer* 2 (pp. 115-130). Springer, Boston, MA.
- [20] Perricone, N. V., 2001. Treatment of skin disorders with olive oil polyphenols. *PCT Int Appl*, 16, p. WO0176579.
- [21] Budiyanto, A., Ahmed, N. U., Wu, A., Bito, T., Nikaido, O., Osawa, T., Ueda, M. and Ichihashi, M., 2000. Protective effect of topically applied olive oil against photocarcinogenesis following UVB exposure of mice. *Carcinogenesis*, 21 (11), pp. 2085-2090.
- [22] Kränke, B., Komericki, P. and Aberer, W., 1997. Olive oil-contact sensitizer or irritant? *Contact Dermatitis*, 36 (1), pp. 5-10.
- [23] Van Boven, M., Daenens, P., Maes, K. and Cokelaere, M., 1997. Content and composition of free sterols and free fatty alcohols in jojoba oil. *Journal of agricultural and food chemistry*, 45 (4), pp. 1180-1184.
- [24] Van Boven, M., Holser, R. A., Cokelaere, M., Decuyper, E., Govaerts, C. and Lemey, J., 2000. Characterization of triglycerides isolated from jojoba oil. *Journal of the American Oil Chemists' Society*, 77 (12), pp. 1325-1329.
- [25] Arquette, D. J., Bailyn, E. M., Palenske, J., DeVorn Bergman, D. and Rheins, L. A., 1998. Non-comedogenic and hypoallergenic properties of jojoba oil and hydrogenated jojoba oil. *Journal of the Society of Cosmetic Chemists*, 49 (6), pp. 377-383.
- [26] Akinyele, B. O. and Odiyi, A. C., 2007. Comparative study of vegetative morphology and the existing taxonomic status of *Aloe vera* L. *Journal of plant Sciences*, 2 (5), pp. 558-563.
- [27] Basmatker, G., Jais, N. and Daud, F., 2011. *Aloe vera*: a valuable multifunctional cosmetic ingredient. *Int J Med Aromat Plants*, 1, pp. 338-341.
- [28] Maeda, K. and Fukuda, M., 1996. Arbutin: mechanism of its depigmenting action in human melanocyte culture. *Journal of Pharmacology and Experimental Therapeutics*, 276 (2), pp. 765-769.
- [29] Young, A. J. and Lowe, G. M., 2001. Antioxidant and prooxidant properties of carotenoids. *Archives of Biochemistry and biophysics*, 385 (1), pp. 20-27.
- [30] Hashemi, S. A., Madani, S. A. and Abediankenari, S., 2015. The review on properties of *Aloe vera* in healing of cutaneous wounds. *BioMed research international*, 2015.
- [31] Saklani, S., Prashar, D. and Sharma, D., 2012. An Economical Overview on Herbal Cosmetics. *Research Journal of Topical and Cosmetic Sciences*, 3 (1), p. II.
- [32] Singh, A., Singh, A. K., Narayan, G., Singh, T. B. and Shukla, V. K., 2014. Effect of Neem oil and Haridra on non-healing wounds. *Ayu*, 35 (4), p. 398.
- [33] Damalas, C. A., 2011. Potential Uses of Turmeric ('*Curcuma longa*') Products as Alternative Means of Pest Management in Crop Production. *Plant Omics*, 4 (3), p. 136.
- [34] Aggarwal, B. B., Sundaram, C., Malani, N. and Ichikawa, H., 2007. Curcumin: the Indian solid gold. In *The molecular targets and therapeutic uses of curcumin in health and disease* (pp. 1-75). Springer, Boston, MA.
- [35] FUJIYAMA-FUJIWARA, Y., UMEDA, R. and IGARASHI, O., 1992. Effects of sesamin and curcumin on $\Delta 5$ -desaturation and chain elongation of polyunsaturated fatty acid metabolism in primary cultured rat hepatocytes. *Journal of nutritional science and vitaminology*, 38 (4), pp. 353-363.
- [36] Chaudhari, K. R., 1950. Turmeric, haldi or haridra, in eye diseases. *Antiseptic*, 47 (1), p. 67.
- [37] Nadkarni, K. M., 1976. *Curcuma longa*. *Indian Materia Medica*, 414.
- [38] Saikia, A. P., Ryakala, V. K., Sharma, P., Goswami, P. and Bora, U., 2006. Ethnobotany of medicinal plants used by Assamese people for various skin ailments and cosmetics. *Journal of Ethnopharmacology*, 106 (2), pp. 149-157.
- [39] Mazumder, A., Raghavan, K., Weinstein, J., Kohn, K. W. and Pommier, Y., 1995. Inhibition of human immunodeficiency virus type-1 integrase by curcumin. *Biochemical pharmacology*, 49 (8), pp. 1165-1170.
- [40] Mesa, M. D., Ramírez-Tortosa, M. C., Aguilera, C. M. and Gil, A., 2000. Nutritional and pharmacological effects of *Curcuma longa* L. extracts. *Recent research developments in nutrition*, 3, pp. 157-171.
- [41] Phan, T. T., See, P., Lee, S. T. and Chan, S. Y., 2001. Protective effects of curcumin against oxidative damage on skin cells in vitro: its implication for wound healing. *Journal of Trauma and Acute Care Surgery*, 51 (5), pp. 927-931.
- [42] Ozaki, K., Kawata, Y., Amano, S. and Hanazawa, S., 2000. Stimulatory effect of curcumin on osteoclast apoptosis. *Biochemical pharmacology*, 59 (12), pp. 1577-1581.

- [43] Aruna, K. and Sivaramakrishnan, V. M., 1996. Anticarcinogenic effects of the essential oils from cumin, poppy and basil. *Phytotherapy research*, 10 (7), pp. 577-580.
- [44] Huang, M. T., Lysz, T., Ferraro, T., Abidi, T. F., Laskin, J. D. and Conney, A. H., 1991. Inhibitory effects of curcumin on in vitro lipoxygenase and cyclooxygenase activities in mouse epidermis. *Cancer research*, 51 (3), pp. 813-819.
- [45] Huang, M. T., Smart, R. C., Wong, C. Q. and Conney, A. H., 1988. Inhibitory effect of curcumin, chlorogenic acid, caffeic acid, and ferulic acid on tumor promotion in mouse skin by 12-O-tetradecanoylphorbol-13-acetate. *Cancer research*, 48 (21), pp. 5941-5946.
- [46] Scartezzini, P. and Speroni, E., 2000. Review on some plants of Indian traditional medicine with antioxidant activity. *Journal of ethnopharmacology*, 71 (1-2), pp. 23-43.
- [47] Unnikrishnan, M. K. and Rao, M. N., 1995. Inhibition of nitrite induced oxidation of hemoglobin by curcuminoids. *Die Pharmazie*, 50 (7), pp. 490-492.
- [48] Reddy, A. C. P. and Lokesh, B. R., 1994. Effect of dietary turmeric (*Curcuma longa*) on iron-induced lipid peroxidation in the rat liver. *Food and chemical toxicology*, 32 (3), pp. 279-283.
- [49] Rao, M. N. A., 1994. Curcuminoids as potent inhibitors of lipid peroxidation. *Journal of Pharmacy and Pharmacology*, 46 (12), pp. 1013-1016.
- [50] Rao, T. S., Basu, N. and Siddiqui, H. H., 2013. Anti-inflammatory activity of curcumin analogues. *Indian journal of medical research*, 137 (4).
- [51] Ammon, H. P. and Wahl, M. A., 1991. Pharmacology of *Curcuma longa*. *Planta medica*, 57 (01), pp. 1-7.
- [52] Shah, N. C., 1982. Herbal folk medicines in Northern India. *Journal of Ethnopharmacology*, 6 (3), pp. 293-301.
- [53] Uhe, G., 1974. Medicinal plants of Samoa; a preliminary survey of the use of plants for medicinal purposes in the Samoa Islands. *Econ. Bot*, 28 (1).
- [54] Awasthi, P. and Dixit, S., 2009. Chemical composition of *Curcuma Longa* leaves and rhizome oil from the plains of Northern India. *Journal of Young Pharmacists*, 1 (4), p. 312.
- [55] Miller, A. R., Kelley, T. J. and Mujer, C. V., 1990. Anodic peroxidase isoenzymes and polyphenol oxidase activity from cucumber fruit: tissue and substrate specificity. *Phytochemistry*, 29 (3), pp. 705-709.
- [56] Mallik, J. and Akhter, R., 2012. Phytochemical screening and in-vitro evaluation of reducing power, cytotoxicity and anti-fungal activities of ethanol extracts of *Cucumis sativus*. *International Journal of Pharmaceutical & Biological Archives*, 3 (3), pp. 555-560.
- [57] Yan, X. N., Sikora, R. A. and Zheng, J. W., 2011. Potential use of cucumber (*Cucumis sativus* L.) endophytic fungi as seed treatment agents against root-knot nematode *Meloidogyne incognita*. *Journal of Zhejiang University SCIENCE B*, 12 (3), pp. 219-225.
- [58] Benefits of almond oil [online], Available from: http://www.indiaparenting.com/health/324_3379/benefitsof-almond-oil.html
- [59] Muley, B. P., Khadabadi, S. S. and Banarase, N. B., 2009. Phytochemical constituents and pharmacological activities of *Calendula officinalis* Linn (Asteraceae): a review. *Tropical Journal of Pharmaceutical Research*, 8 (5).
- [60] Okoh, O. O., Sadimenko, A. P., Asekun, O. T. and Afolayan, A. J., 2008. The effects of drying on the chemical components of essential oils of *Calendula officinalis* L. *African Journal of Biotechnology*, 7 (10).
- [61] Athar, M. and Nasir, S. M., 2005. Taxonomic perspective of plant species yielding vegetable oils used in cosmetics and skin care products. *African journal of biotechnology*, 4 (1), pp. 36-44.
- [62] McQuestion, M., 2006, August. Evidence-based skin care management in radiation therapy. In *Seminars in Oncology Nursing* (Vol. 22, No. 3, pp. 163-173). WB Saunders.
- [63] Bolderston, A., Lloyd, N. S., Wong, R. K., Holden, L., Robb-Blenderman, L. and Supportive Care Guidelines Group of Cancer Care Ontario Program in Evidence-Based Care, 2006. The prevention and management of acute skin reactions related to radiation therapy: a systematic review and practice guideline. *Supportive Care in Cancer*, 14 (8), p. 802.
- [64] Pommier, P., Gomez, F., Sunyach, M. P., D Hombres, A., Carrie, C. and Montbarbon, X., 2004. Phase III randomized trial of *Calendula officinalis* compared with trolamine for the prevention of acute dermatitis during irradiation for breast cancer. *Journal of Clinical Oncology*, 22 (8), pp. 1447-1453.
- [65] Bijauliya, R. K., Alok, S., Kumar, M., Chanchal, D. K. and Yadav, S., 2017. A comprehensive review on herbal cosmetics. *Int J Pharm Sci Res*, 8 (12), pp. 4930-4949.
- [66] Kuroda, Y. and Hara, Y., 1999. Antimutagenic and anticarcinogenic activity of tea polyphenols. *Mutation Research/Reviews in Mutation Research*, 436 (1), pp. 69-97.
- [67] Katiyar, S. K. and Elmets, C. A., 2001. Green tea polyphenolic antioxidants and skin photoprotection. *International journal of oncology*, 18 (6), pp. 1307-1313.
- [68] Miyazawa, T., 2000. Absorption, metabolism and antioxidative effects of tea catechin in humans. *Biofactors*, 13 (1 - 4), pp. 55-59.
- [69] Pietta, P., Simonetti, P. and Mauri, P., 1998. Antioxidant activity of selected medicinal plants. *Journal of Agricultural and Food Chemistry*, 46 (11), pp. 4487-4490.
- [70] Mitscher, L. A., Jung, M., Shankel, D., Dou, J. H., Steele, L. and Pillai, S. P., 1997. Chemoprotection: a review of the potential therapeutic antioxidant properties of green tea (*Camellia sinensis*) and certain of its constituents. *Medicinal research reviews*, 17 (4), pp. 327-365.
- [71] Fourneau, C., Laurens, A., Hocquemiller, R. and Cave, A., 1996. Radical scavenging evaluation of green tea extracts. *Phytotherapy Research*, 10 (6), pp. 529-530.
- [72] Elmets, C. A., Singh, D., Tubesing, K., Matsui, M., Katiyar, S. and Mukhtar, H., 2001. Cutaneous photoprotection from ultraviolet injury by green tea polyphenols. *Journal of the American Academy of Dermatology*, 44 (3), pp. 425-432.
- [73] Zhao, J. F., Jin, X. H., Athar, M., Bickers, D. R., Wang, Z. Y., Zhang, Y. J. and Santella, R. M., 1999. Green Tea Protects Against Psoralen Plus Ultraviolet A-Induced Photochemical Damage to Skin1. *Journal of investigative dermatology*, 113 (6), pp. 1070-1075.

- [74] Lee, O. S., Kang, H. H. and Han, S. H., 1997. Oriental herbs in cosmetics: Plant extracts are reviewed for their potential as cosmetic ingredients. *Cosmetics and toiletries*, 112 (1), pp. 57-64. Lee, O. S., Kang, H. H. and Han, S. H., 1997. Oriental herbs in cosmetics: Plant extracts are reviewed for their potential as cosmetic ingredients. *Cosmetics and toiletries*, 112 (1), pp. 57-64. Lee, O. S., Kang, H. H. and Han, S. H., 1997. Oriental herbs in cosmetics: Plant extracts are reviewed for their potential as cosmetic ingredients. *Cosmetics and toiletries*, 112 (1), pp. 57-64.
- [75] Schreiner, V., Schoenrock, U., Staeb, F., Max, H., Sandhoff, K. and Doering, T., 1999. Cosmetic or dermatologic preparations containing catechins or green tea extract. *PCT Int Appl*, 27, p. WO9962478.
- [76] Katiyar, S. K., Ahmad, N. and Mukhtar, H., 2000. Green tea and skin. *Archives of Dermatology*, 136 (8), pp. 989-994.
- [77] Adhami, V. M., Afaq, F., Ahmad, N., Hara, Y. and Mukhtar, H., 2004. Tea polyphenols as cancer chemopreventive agents. In *Cancer Chemoprevention* (pp. 437-449). Humana Press, Totowa, NJ.
- [78] Mukhtar, H., Katiyar, S. K. and Agarwal, R., 1994. Green tea and skin—anticarcinogenic effects. *Journal of investigative dermatology*, 102 (1), pp. 3-7.
- [79] Singh, N., Pandey, M. K., Sharma, A. and Prakash, J., 2014. Indian medicinal plants: For hair care and cosmetics. *World J Pharm Sci*, 2 (11), pp. 1552-1556.
- [80] Chávez-Quintal, P., González-Flores, T., Rodríguez-Buenfil, I. and Gallegos-Tintoré, S., 2011. Antifungal activity in ethanolic extracts of *Carica papaya* L. cv. Maradol leaves and seeds. *Indian journal of microbiology*, 51 (1), pp. 54-60.
- [81] Sadek, K. M., 2012. Antioxidant and immunostimulant effect of *Carica papaya* Linn. aqueous extract in acrylamide intoxicated rats. *Acta informatica medica*, 20 (3), p. 180.
- [82] Kamal, G. M., Anwar, F., Hussain, A. I., Sarri, N. and Ashraf, M. Y., 2011. Yield and chemical composition of Citrus essential oils as affected by drying pretreatment of peels. *International Food Research Journal*, 18 (4), p. 1275.
- [83] González-Molina, E., Domínguez-Perles, R., Moreno, D. A. and García-Viguera, C., 2010. Natural bioactive compounds of Citrus limon for food and health. *Journal of pharmaceutical and biomedical analysis*, 51 (2), pp. 327-345.
- [84] Fisher, K. and Phillips, C. A., 2006. The effect of lemon, orange and bergamot essential oils and their components on the survival of *Campylobacter jejuni*, *Escherichia coli* O157, *Listeria monocytogenes*, *Bacillus cereus* and *Staphylococcus aureus* in vitro and in food systems. *Journal of Applied Microbiology*, 101 (6), pp. 1232-1240.
- [85] Calabrese, V., Randazzo, S. D., Catalano, C. and Rizza, V., 1999. Biochemical studies on a novel antioxidant from lemon oil and its biotechnological application in cosmetic dermatology. *Drugs under experimental and clinical research*, 25 (5), pp. 219-225.
- [86] Lu, X., Rasco, B. A., Jabal, J. M., Aston, D. E., Lin, M. and Konkel, M. E., 2011. Investigating antibacterial effects of garlic (*Allium sativum*) concentrate and garlic-derived organosulfur compounds on *Campylobacter jejuni* by using Fourier transform infrared spectroscopy, Raman spectroscopy, and electron microscopy. *Appl. Environ. Microbiol.*, 77 (15), pp. 5257-5269.
- [87] Pazyar, N. and Feily, A., 2011. Garlic in dermatology. *Dermatology reports*, 3 (1).
- [88] Shin, J. H., Ryu, J. H., Kang, M. J., Hwang, C. R., Han, J. and Kang, D., 2013. Short-term heating reduces the anti-inflammatory effects of fresh raw garlic extracts on the LPS-induced production of NO and pro-inflammatory cytokines by downregulating allicin activity in RAW 264.7 macrophages. *Food and chemical toxicology*, 58, pp. 545-551.
- [89] Lyantagaye, S. L., 2011. Ethnopharmacological and phytochemical review of *Allium* species (sweet garlic) and *Tulbaghia* species (wild garlic) from Southern Africa. *Tanzania Journal of Science*, 37 (1).
- [90] Yu, H., Xu, G., Zhao, X. and Wang, S., 2001. Antioxidation effect of polyhydroxystilbene extracted from grape seed in hyperlipidemia rabbits. *Shandong Yike Daxue Xuebao*, 39, pp. 547-548.
- [91] Pietta, P., Simonetti, P. and Mauri, P., 1998. Antioxidant activity of selected medicinal plants. *Journal of Agricultural and Food Chemistry*, 46 (11), pp. 4487-4490.
- [92] Bagchi, D., Garg, A., Krohn, R. L., Bagchi, M., Tran, M. X. and Stohs, S. J., 1997. Oxygen free radical scavenging abilities of vitamins C and E, and a grape seed proanthocyanidin extract in vitro. *Research communications in molecular pathology and pharmacology*, 95 (2), pp. 179-189.
- [93] Hemmati, A. A., 2015. The topical effect of grape seed extract 2% cream on surgery wound healing. *Global journal of health science*, 7 (3), p. 52.
- [94] Tokutake, S. and Yamakoshi, J., 2001. Functional application of grape seed polyphenols. *New Food Industry*, 43, pp. 1-9.
- [95] Lee, Y. H., Lee, S. J., Jan, J. K., Park, S. Y. and Lee, H. K., 2000. Grape seed extracts as tyrosinase inhibitors and their uses as drugs, cosmetics, and food. *Jpn Kokai Tokkyo Koho*, 10, p. JP2000159681.
- [96] <https://www.newdirectionsaromatics.com/products/botanical-extracts>.
- [97] Benefits of almond oil as moisturizer [online], Available from: http://www.ehow.com/facts_6177371_benefits-using-almond-oilmoisturizer_html.
- [98] Hart, J., Polla, C. and Hull, J. C., 1998. Oat fractions: their rejuvenating effects on skin and hair. *Cosmetics and toiletries*, 113 (3), pp. 45-52.
- [99] MEISTER, B., 1963. A bath oil high in phospholipid content. *Journal of the American Geriatrics Society*, 11 (8), pp. 789-792.
- [100] Sadhu, S. K., Khan, M. S., Ohtsuki, T. and Ishibashi, M., 2007. Secoiridoid components from *Jasminum grandiflorum* pp 1718–1721. *Phytochemistry*, 68 (13).
- [101] Chaturvedi, A. P. and Tripathi, Y. B., 2011. Methanolic extract of leaves of *Jasminum grandiflorum* Linn modulates oxidative stress and inflammatory mediators. *Inflammopharmacology*, 19 (5), p. 273.
- [102] Zhang, X. H., Jia, Y. X., Zhao, J. T. and Ma, G. H., 2012. Chemical composition of volatile oils from the pericarps of Indian sandalwood (*Santalum album*) by different extraction methods. *Natural product communications*, 7 (1), pp. 93-96.

- [103] Misra, B. B. and Dey, S., 2013. Evaluation of in vivo anti-hyperglycemic and antioxidant potentials of α -santalol and sandalwood oil. *Phytomedicine*, 20 (5), pp. 409-416.
- [104] Misra, B. B. and Dey, S., 2012. Differential extraction and GC-MS based quantification of sesquiterpenoids from immature heartwood of East Indian sandalwood tree. *Journal of Natural Sciences Research*, 2 (6), pp. 29-33.
- [105] Misra, B. B. and Dey, S., 2013. Shikimic acid (tamiflu precursor) production in suspension cultures of East Indian sandalwood (*Santalum album*) in air-lift bioreactor. *Journal of Postdoctoral Research*, 1 (1), pp. 1-9.
- [106] Hu, Y., Ye, W., Yin, Z. and Zhao, S., 2007. Chemical constituents from flos *Sesamum indicum* L. *Yao xue xue bao= Acta pharmaceutica Sinica*, 42 (3), pp. 286-291.
- [107] Suja, K. P., Jayalekshmy, A. and Arumughan, C., 2004. Free radical scavenging behavior of antioxidant compounds of sesame (*Sesamum indicum* L.) in DPPH system. *Journal of agricultural and food chemistry*, 52 (4), pp. 912-915.
- [108] Hussain, A. I., Anwar, F., Sherazi, S. T. H. and Przybylski, R., 2008. Chemical composition, antioxidant and antimicrobial activities of basil (*Ocimum basilicum*) essential oils depends on seasonal variations. *Food chemistry*, 108 (3), pp. 986-995.
- [109] Prakash, P. and Gupta, N., 2005. Therapeutic uses of *Ocimum sanctum* Linn (Tulsi) with a note on eugenol and its pharmacological actions: a short review. *Indian journal of physiology and pharmacology*, 49 (2), p. 125.
- [110] Khare CP (2005). *Encyclopedia of Indian medicinal plants*. Berlin Heidelberg, Germany: Springer- Verlag, 2005; 372.
- [111] Tripathi, P., Kumar, R., Sharma, A. K., Mishra, A. and Gupta, R., 2010. *Pistia stratiotes* (Jalkumbhi). *Pharmacognosy reviews*, 4 (8), p. 153.
- [112] Barreto, J. C., Trevisan, M. T., Hull, W. E., Erben, G., De Brito, E. S., Pfundstein, B., Würtele, G., Spiegelhalder, B. and Owen, R. W., 2008. Characterization and quantitation of polyphenolic compounds in bark, kernel, leaves, and peel of mango (*Mangifera indica* L.). *Journal of agricultural and food chemistry*, 56 (14), pp. 5599-5610.
- [113] Fatima, A., Alok, S., Agarwal, P., Singh, P. P. and Verma, A., 2013. Benefits of herbal extracts in cosmetics: a review. *International Journal of Pharmaceutical Sciences and Research*, 4 (10), p. 3746.
- [114] Dweck AC. 1997c. Indian plants. *Cosmet Toiletries* 112: 37-51.
- [115] Nesterova, O. V., Samylina, I. A., Bobylev, R. V. and Miroshnikov, A. I., 1990. Study of physicochemical properties and fatty acid composition of pumpkin oil. *Farmatsiya*, 39, pp. 75-76.
- [116] Akhtar, M. W., Iqbal, M. Z. and Nawazish, M. N., 1980. Lipid class and fatty acid composition of pumpkin seed oil. *Pakistan Journal of Scientific Research*.
- [117] Morton, J. F., 1981. *Atlas of medicinal plants of Middle America: Bahamas to Yucatan*. Charles C. Thomas.
- [118] Griffiths, G., Trueman, L., Crowther, T., Thomas, B. and Smith, B., 2002. Onions—a global benefit to health. *Phytotherapy research*, 16 (7), pp. 603-615.
- [119] Dorsch, W., 1997. *Allium cepa* L (Onion): Part 2 chemistry, analysis and pharmacology. *Phytomedicine*, 3 (4), pp. 391-397.
- [120] Dorsch, W., Schneider, E., Bayer, T., Breu, W. and Wagner, H., 1990. Anti-inflammatory effects of onions: inhibition of chemotaxis of human polymorphonuclear leukocytes by thiosulfates and cepaenes. *International Archives of Allergy and Immunology*, 92 (1), pp. 39-42.
- [121] Dorsch, W. and Ring, J., 1984. Suppression of immediate and late anti - IgE - induced skin reactions by topically applied alcohol/onion extract. *Allergy*, 39 (1), pp. 43-49.
- [122] Middleton E. 1984. The flavonoids. *Trends Pharmacol Sci (TIPS)* 5: 335-338.
- [123] Elnima, E. I., Ahmed, S. A., Mekkawi, A. G. and Mossa, J. S., 1983. The antimicrobial activity of garlic and onion extracts. *Die Pharmazie*, 38 (11), pp. 747-748.
- [124] Conner, D. E. and Beuchat, L. R., 1984. Effects of essential oils from plants on growth of food spoilage yeasts. *Journal of food science*, 49 (2), pp. 429-434.
- [125] Ravikumar, P. and Anuradha, C. V., 1999. Effect of fenugreek seeds on blood lipid peroxidation and antioxidants in diabetic rats. *Phytotherapy research*, 13 (3), pp. 197-201.
- [126] Acharya, S. N., Thomas, J. E. and Basu, S. K., 2008. Fenugreek, an alternative crop for semiarid regions of North America. *Crop science*, 48 (3), pp. 841-853.
- [127] P Singh, T., M Singh, O. and B Singh, H., 2011. *Adhatoda vasica* Nees: Phytochemical and pharmacological profile. *The Natural Products Journal*, 1 (1), pp. 29-39.
- [128] Nagler, A. R., Milam, E. C. and Orlow, S. J., 2016. The use of oral antibiotics before isotretinoin therapy in patients with acne. *Journal of the American Academy of Dermatology*, 74 (2), pp. 273-279.
- [129] Rao, P. V. and Gan, S. H., 2014. Cinnamon: a multifaceted medicinal plant. *Evidence-Based Complementary and Alternative Medicine*, 2014.
- [130] Javed, A., Usman, M., Haider, S. M., Zafar, B. and Ifikhar, K., 2019. Potential of Indigenous Plants for Skin Healing and Care. *American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)*, 51 (1), pp. 192-211.
- [131] Oryan, A., Mohammadalipour, A., Moshiri, A. and Tabandeh, M. R., 2016. Topical application of Aloe vera accelerated wound healing, modeling, and remodeling: an experimental study. *Annals of plastic surgery*, 77 (1), pp. 37-46.
- [132] Sánchez-Machado, D. I., López-Cervantes, J., Sendón, R. and Sanches-Silva, A., 2017. Aloe vera: Ancient knowledge with new frontiers. *Trends in Food Science & Technology*, 61, pp. 94-102.