



E-ISSN: 2788-9254
P-ISSN: 2788-9246
IJPSDA 2021; 1(2): 13-19
Received: 14-05-2021
Accepted: 18-06-2021

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Review on market available herbal antioxidant content of facewashes in India

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Abstract

Human beings are obsessed with looking beautiful. And so, various beauty products are in use to look charming and young. Worldwide herbal ingredients are popular for the use in cosmetics. Since herbal formulations are free from harmful synthetic chemicals, they always attract considerable attention to prove nontoxic to the skin. Antioxidants are substances that prevent or slow down the damage to cells caused by free radicals. Free radical formation by scavenging them or promoting their decomposition and suppress disorders is prevented by the natural antioxidants. Topical application of antioxidants enriches the endogenous cutaneous system which decreases the UV-radiation mediated oxidative damage and also prevents the oxidative stress-mediated diseases. Various natural antioxidant ingredients which are used in face washes are being discussed thoroughly in the current review.

Keywords: antioxidants, face washes, antioxidants containing face washes

1. Introduction

Antioxidants

Antioxidants are oxidation inhibitors which retard or prevent the oxidation^[1]. Free radicals are the foundation of any biochemical process and it is an essential part of aerobic life and metabolism. Oxidative stress due to free radicals is the main reason for the majority of diseases/disorders^[2]. Natural antioxidants or oxidation inhibiting agents prevent the formation of free radicals^[3].

Facewash

Face Wash is a face care product which removes makeup, dead skin cells, oil, dirt's and other pollutants from the facial skin. This helps to unclog pores and prevent skin conditions such as acne. It is a liquid soap especially used for washing the face. The washing quality of face wash is very good and very soft to the skin. Day by day it is becoming very popular in all classes of society. Exposing to harsh weather conditions and environment pollutants every day skin becomes dirt and grime which makes your skin oily. It is essential to clear the dust, if not the skin applications (like creams, lotions, etc...) will not be able to penetrate the skin and nourish the skin cells. And this is why our skin needs herbal facial cleansers which can be used as a part of skin care regimen along with moisturizer and toner^[4].

The uses and advantages of face washes are as follows,

- It helps to keep skin fresh and healthy.
- To remove all traces of makeup every day
- For cleansing the skin.
- Anti-aging,
- Keeps the skin clean and shiny.
- Stimulates the generation of skin cells and helps in their renewal.
- Help plug the pores clear^[2]
- It removes dead skin cells
- It makes the skin look radiant.
- Cleansing the pores regularly using facewash, avoids all the skin problems like excessive oil pores, acne, whiteheads, blackheads, etc...

2. Antioxidants containing face wash

Usage of skin products that contain antioxidants are too good for boosting the antioxidant power needed to maintain healthy skin at any age. Ingredients in herbal face washes like antioxidants, carotenoids and vitamins helps to reduce skin problems and also to retain the

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elasticity of the skin. The concentration of antioxidants in face washes aids the skin against free radicals like car exhaust, UV rays and many more. It also assists in reduction

of redness and inflammation caused by sunburn and acne 12. We hereby compare various herbal antioxidants containing market available face wash formulations.

Table 1: Comparison of various herbal antioxidants containing market available face wash formulations.

S. No	Brand Name	Product Name	Herbal Antioxidants Present
1	Lotus Herbals	Jojobawash Active Milli Capsules Nourishing Face Wash	Avocado extract; Vitamin E
2	Lotus Herbals	Lotus Herbals White Glow 3 In 1 Deep Cleansing Skin Whitening Facial Foam	Aloe Vera
3	Lotus Herbals	Lotus Herbals Tea Tree And Cinnamon Anti Acne Oil Control Face Wash	Tea tree oil
4	Lotus Herbals	Lotus Professional Phyto-Rx Whitening & Brightening Face Wash	Amla berry; Lychee
5	Lotus Herbals	Lotus Herbals Whiteglow Activated Charcoal Brightening Face Wash	Tea tree oil; Activated charcoal
6	Mcaffeine	Mcaffeine Green Tea Face Wash	Green tea; Vitamin C
7	Mcaffeine	Mcaffeine Naked & Raw Coffee Face Wash	White water lily; Aloe vera; Caffeine; Seaweed
8	Himalaya Herbals	Himalaya Herbals Tan Removal Orange Face Wash	Orange peel; Papain; Honey
9	Himalaya Herbals	Himalaya Herbals Fresh Start Oil Clear Face Wash Strawberry	Strawberry; Indian Gooseberry
10	Himalaya Herbals	Himalaya Herbals Fresh Start Oil Clear Face Wash Peach	Peach; Indian Gooseberry
11	Himalaya Herbals	Himalaya Fresh Start Oil Clear Face Wash Blueberry	Blue berry; Indian Gooseberry
12	Himalaya Herbals	Himalaya Herbals Fresh Start Oil Clear Face Wash Lemon	Lemon; Indian Gooseberry
14	Plum	Plum Hello Aloe Skin Loving Face Wash	Aloe Vera; Olive oil
15	Plum	Chamomile & White Tea Skin Revival Face Wash	White tea extract
16	Mama Earth	Mamaearth Vitamin C Foaming Face Wash With Turmeric	Vitamin C; Turmeric; Cucumber; Aloe Vera
17	Mama Earth	Mamaearth Ubtan Face Wash With Turmeric & Saffron For Tan Removal.	Walnut beads; Saffron extract; Turmeric
18	Mama Earth	Mamaearth Face Wash With Tea Tree Oil And Neem Extract For Acne & Pimples	Aloe Vera extract; Neem extract; Tea tree oil; Walnut beads
19	Mama Earth	Mamaearth Charcoal Face Wash With Coffee For Oil Control	Activated charcoal; Coffee extract; Aloe Vera extract
20	Mama Earth	Mamaearth Coco Face Wash With Coffee And Cocoa For Skin Awakening	Coffee extract; Cocoa extract
21	Forest Essentials	Forest Essential Facial Face Wash Sandalwood And Orange Peel	Bamboo shoot; Sandalwood; Sweet orange; Aloe Vera; Honey
22	Biotique	Biotique Bio Neem Face Purifying Wash	Ashwagandha; Neem leaf
23	Biotique	Biotique Bio Papaya Visibility Flawless Face Wash	Papaya; Neem; Turmeric
24	Biotique	Biotique Bio Honey Gel Refreshing Foaming Face Wash	Henna; Bahaldi (Turmeric); Honey
25	Biotique	Biotique Bio White Advanced Fairness Face Wash	Jasmine; Chironji
26	Jovees Herbals	Jovees Grape Fairness Face Wash	Grape seed extract; Olive oil; AloeVera extract; Vitamin E; Orange peel extract
27	Jovees Herbals	Jovees Gold Ultra Radiance Cleaner	Beeswax; Jojoba oil; Marigold oil; Turmeric oil
28	Khadi Naturals	Khadi Naturals Neem Tulsi Herbal Face Wash	Neem; Tea tree oil; Aloe Vera
29	Khadi Naturals	Khadi Naturals Aloe Vera Face Wash	Lavender oil; Aloevera; Neem oil; Rose water; Vitamin E
30	Khadi Naturals	Khadi Natural Herbal Face Wash	Wheat germ oil; Aloe Vera extract; Rose water; Tea tree oil
31	Khadi Naturals	Khadi Naturals Neem Herbal Face Wash	Wheat germ oil; Aloe Vera extract; Tea Tree oil; Neem oil
32	Wow	Wow Skin Science Brightening Vitamin C Foaming Face Wash	Orange essential oil; Lemon essential oil; Aloe vera extract; Liquorice extract; Mulberry extract
33	Wow	Wow Skin Science Ubtan Foaming Face Wash	Chickpea flour; Turmeric extract; Rose water; Saffron extract; Almond extract; Sandalwood oil
34	Wow	Wow Anti Acne Face Wash	Tea tree oil; Neem leaf extract; Liquorice extract; Mulberry extract; Vitamin E; Vitamin B5; Aloe Vera extract

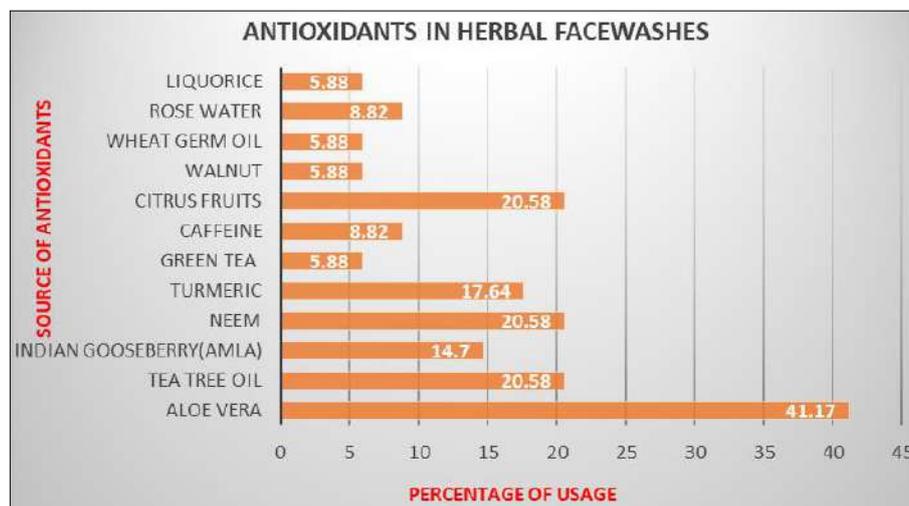


Fig 1: Most used natural antioxidants in market available herbal facewashes in India

The above figure compares the source of natural antioxidants used in market available herbal facewashes with the percentage of use.

3. Herbal antioxidants and their properties

1. Avocado extract

Carotenoids present in avocados improves the skin elasticity. The rich antioxidant property in avocado fight free radicals and protect skin from external damage. Avocados are high in antioxidants, including lutein and zeaxanthin [5].

2. Aloe vera

Aloe Vera contains polyphenols which acts as an antioxidant. Polyphenols and other active ingredients in aloe Vera inhibits certain bacteria which causes skin infections [6]. It also helps in cleansing the skin and removes the dead cells.

3. Tea tree oil

Tea tree oil has skin-soothing properties and is also an antioxidant. Tea tree oil also contains inherent doses of antioxidants such as alpha-terpinene, alpha-terpinolene and gamma-terpinene, listed in the order of antioxidant activity. Antioxidant protection helps to neutralize harmful free radicals present within the body and in the environment [7].

4. Cinnamon

Cinnamon is loaded with polyphenols which acts as antioxidants. It assists to protect the body from oxidative damage caused by the free radicals. It helps in healing acne scars and spots [8].

5. Amla berry

Amla berries are rich in antioxidants. Amla berries are also an excellent source of Vitamin C [9]. It help to brighten the skin. The astringent properties in Indian gooseberry helps reduce excess skin oiliness and the tannins act as free radical scavengers.

6. Lychee

The antioxidant activity found in the peel and seeds of the lychee is high, and is mainly due to ascorbic acid and beta-carotene. It contains good amount of Vitamin C and

Vitamin B complex [10]. It helps to reduce the dryness of the skin.

7. Activated charcoal

Activated charcoal is a powerful ingredient to detox and fight bloating issues. It helps to suck out blackheads and whiteheads efficiently from its root. Activated charcoal will bind with all kinds of things including some of the vitamins, minerals and antioxidants [11]. Activated charcoal (coconut shell powder) is a charcoal substance made from coconut shells (It can also be made from peat, coal, olive pits, sawdust) In order to activate charcoal it is oxidized using steam or air at high temperature.

8. Green tea

Green tea contains a variety of polyphenol compounds which hold antioxidant activity. The primary active ingredient present in green tea are flavanol monomers which is also known as catechins. Epigallocatechin-3-gallate and epicatechin-3-gallate are the highly effective antioxidant compounds in green tea. These natural antioxidants effectively combats acne and leave you with clear refreshed healthy skin [12].

9. Papaya

Papaya contains antioxidant phytochemicals, such as vitamin C, beta carotene, lycopene and vitamin E all of which acts as antioxidants [13]. It contains healthy antioxidants. It can act as a youth activator.

10. Olive oil

The polyphenols in olive oil have characteristics like antioxidant, anti-inflammatory, anti-viral, anti-microbial, anti-thrombotic, anti-mutagenic, hypoglycaemic, etc... Hydroxytyrosol, tyrosol, and oleuropein are the phenolic compounds that are mainly responsible for antioxidant activity of olive oil. It contains large amount of antioxidants and vitamin E&K. It helps to prevent acne. It helps to moisturize the skin [14].

11. White tea extract

White tea abundantly contains catechins (a plant antioxidant). Catechins inhibit plaque bacteria [15]. White tea also contains tannins. Studies show that the combination of tannins and fluoride could also inhibit the growth of plaque-

causing bacteria. Being especially rich in antioxidants, it helps the skin fight oxidative damage that results from sun exposure.

12. Ashwagandha

Ashwagandha improves the body's defense against disease by improving the cell-mediated immunity. It also possesses potent antioxidant properties that help protect against cellular damage caused by free radicals^[16].

13. Neem

The anti-ageing property of neem is known for its best. The skin is protected from harmful UV rays, pollution and other environmental factors due to the antioxidant property of neem. It also contains vitamins and fatty acids which improves and maintains the skin elasticity along with the reduction of fine lines and wrinkles. Neem leaf extract, containing polyphenols. It has antioxidants activity. It helps to clear acne, scars, pigmentation and blackheads. Neem has amazing moisturizing property^[17]. It helps to healing and glowing of the skin.

14. Turmeric

Being a most powerful antioxidant turmeric contains curcumin as the most important antioxidant under the curcuminoid category. The main active ingredient in turmeric is curcumin. It has powerful anti-inflammatory effects and is a very strong antioxidant. Curcumin has been shown to be a robust scavenger of oxygen free radicals, which are chemically active molecules that cause damage to the body's cells^[18]. It improves skin complexion. It reduces the dark circle.

15. Henna

Henna extract shows the highest antioxidant activity by the presence of Vitamin E or α -tocopherol. Due to high antioxidant activity it shows a strong cytotoxic property. It contains vitamin B1, B2, B6, B3 and C^[19].

16. Honey

Honey exhibits strong antioxidant activity. For this property following components are responsible Polyphenol compounds (phenolic acids and flavonoids), vitamin C, vitamin E, enzymes (e.g., catalase, peroxidase) and trace elements. It gently removes the dead skin cells and makes the skin supple^[20].

17. Chironji

The antioxidants (flavonoids) present in Chironji^[21]. Blessed with antioxidant properties, Chironji is a boon to achieve spotless radiant skin. It helps in shielding the skin from oxidative radical damage due to the harmful UVA and UVB rays, and hence reduces the risk of the various signs of aging like wrinkles, spots, fine lines, dark circles, etc^[22].

18. Orange peel

The antioxidant property of orange peel is due to the presence of flavonoids in it which can prevent cancer and other disease conditions. The huge amount of Vitamin C in it is more beneficial. The peel contains more vitamin C than the flesh^[23]. Orange peel powder contains Vitamin C which helps to form collagen and elastin which is the secret to beautiful skin. It makes your skin look youthful and bright.

It improves oily skin and makes the skin soft, smooth and firm. It helps unclog pores and reduces blackheads^[24].

19. Jasmine

Jasmine is loaded with powerful plant-based compounds known as polyphenol^[25]. These act as antioxidants in your body and protect your cells against free radical damage. Jasmine is rich in a variety of active chemical components that are beneficial to the skin. It shows anti-ageing properties and protects the skin from environmental stressors because of its antioxidant content. It helps to balance all skin types without irritating them.

20. Strawberry

Strawberries contains antioxidants like anthocyanins, ellagic acid, quercetin and kaempferol^[26]. Strawberries contain high amounts of beneficial plant compounds and antioxidants, such as pelargonidin, ellagitannins, and procyanidins^[27]. Strawberries treat burns, protects skin from UV rays and delays ageing because of its strong antioxidant activity. α -hydroxy acid packed in the strawberries helps to get rid of dead skin cells. Those who have acne can use strawberries to get rid of the skin condition.

21. Lemon

Lemons are a great source of Vitamin C and flavonoids, which comes under the category of antioxidants. It helps to remove free radicals which damage cells of the body. It decreases the dead skin cells that lead to non-inflammatory forms of acne like blackheads^[28].

22. Peach

Peaches are now in season across much of the United States are healthy and contain health promoting flavonoid polyphenolic antioxidants including lutein, zeaxanthin and beta-cryptoxanthin^[29]. Being a great source of Vitamin C, peach helps to remove dark circles and blemishes. Its macronutrients also help in removing wrinkles. It tightens the skin's pores and does wonders for a tired skin.

23. Blueberry

Blueberries contain polyphenol antioxidants, mainly flavonoids. Most of the health benefits of berries is particularly because of anthocyanins (a type of flavonoid)^[30]. It also contains antioxidants - vitamins A & C, plus flavonoids (a type of antioxidant) like quercetin and anthocyanidin. Blueberries are high in antioxidants, fiber, and nutrients. All these together supports the skin ability to fight inflammation related to acne, psoriasis, eczema and premature ageing.

24. White water lily

Flower extract can be a potential source of natural antioxidant. It contains polyphenols and flavonoids^[31]. White water lily helps balance cell renewal, purifies, detoxifies, and soothes the skin while provides moisturising effect. It contains the active alkaloids nupharine and nymphaeane.

25. Caffeine, coffee extract

Coffee is very rich in antioxidants including polyphenols and hydroxycinnamic acids that may improve health and reduce your risk of several diseases. Antioxidant activity of coffee is related to chlorogenic, ferulic, caffeic, and n-

coumaric acids contained in it. In roasted coffee, melanoidins (brown pigments) are synthesized these are strong antioxidants^[32]. In some publications, caffeine and trigonelline are considered to be antioxidants. Caffeine has potent antioxidant properties. It helps protect cells against the UV radiation and slows down the process of photoaging of the skin.

26. Sea weed

Phenolic compounds such as flavonoids, phenolic acids and tannins are considered to be the major contributors to the antioxidant capacity of plants. In edible brown, green and red seaweeds antioxidant properties have been correlated to their phenolic content. Seaweed contains a wide range of antioxidants, such as vitamins A, C and E, carotenoids and flavonoids. The antioxidants in seaweed can help prevent free radical damage to the skin and protect against skin aging. In addition, seaweed can moisturize and calm the skin. It is also good at combating acne^[33].

27. Cucumber

Cucumbers contain several antioxidants, including vitamin C, beta-carotene and manganese, as well as flavonoids, triterpenes. Cucumbers contain vitamin C, beta carotene, manganese, flavonoids^[34] and caffeic acid, two antioxidants that, when applied to the skin, help fend off wrinkles, sun damage, and more. Vitamin C helps build collagen and elastin, those protein fibers that give skin its youthful plumpness.

28. Walnut beads

It is rich in Antioxidants. Walnuts have higher antioxidant activity than any other common nut. This activity comes from vitamin E, melatonin and plant compounds called polyphenols^[35]. Antioxidants and Vitamin E are the skin-fortifying elements in walnuts. It assists in removing dead skin cells, dirt and grime from accumulating on the surface of the skin. It prevents excess oiliness and clogging of pores.

29. Saffron extract

It is a Powerful Antioxidant. Notable saffron antioxidants include crocin, crocetin, safranal, and kaempferol. Crocin and crocetin are carotenoid pigments and responsible for saffron's red color lastly, kaempferol is found in saffron flower petals^[36]. Saffron (kesar) is known for its natural skin lightening qualities as it protectively promotes healthier and glowing skin.

30. Cocoa extract

Cocoa nibs are loaded with antioxidants. Cocoa contains flavonoids including epicatechin, catechin and procyanidins. In fact, cocoa and chocolate products have the highest flavonoid content by weight of any other food. Flavonoids are associated with many health benefits. It helps to soften and detoxify the skin while reducing fine lines and wrinkles and the appearance of scars. The rich aroma relaxes and rejuvenates^[37].

31. Bamboo shoot

Phenols, flavonoids, vitamin C and E are the dominant antioxidants in bambooshoots. Bamboo extract contain various compounds like flavones, glycosides, phenolic acids, and amino acids which together provide antioxidant,

skin-soothing, and astringent properties, higher percentage of silica supports collagen production contributing more glowing and healthier skin appearance, improves skin elasticity^[38].

32. Sandalwood

Antiseptic retains moisture level toning purifying cooling and soothing. It helps in fighting acne-causing bacteria, exfoliates the skin, soothes sunburn, removes suntan and also reduces signs of ageing such as dry skin and wrinkles.

33. Sweet orange

The sweet orange peel reveals the antioxidant activity is strongly associated with the presence of flavonoids, phenolic acids and their derivatives^[39].

34. Lemon essential oil

The main principles of this essential oil are limonene, α -pinene and α -terpinene. Lemon essential oil can kill bacteria that may get trapped in pores and cause breakouts. It can also clarify your skin with antioxidants and vitamin C, gently exfoliating dead skin cells that so often become trapped in hair follicle and pores^[40].

35. Liquorice extract

Seven constituents, with antioxidant capacity, were isolated from *Glycyrrhiza glabra*. It contains beta carotene and vitamin E. It is used to treat skin conditions like eczema and acne. As a rich source of antioxidants, it also offers skin lightening and anti-aging benefits^[41].

36. Mulberry extract

Identified apigenin, luteolin, quercetin, morin, caffeic acid, gallic acid, rutin, umbelliferone, chlorogenic acid, and kaempferol in the fruit of *Morus alba* present in mulberry extract. It is well known for its skin brightening property. It helps to fade away the dark spots and pigmentation caused by ageing and exposure to the UV. It is a wonderful natural alternative to synthetic chemical skin lightening products^[42].

37. Chickpea flour

Phenolic extracts from chickpea flour also showed the inhibitory activities of α -amylase and α -glucosidase as well as significant antioxidant activity. Gram flour has certain properties that treat acne and has been used for this purpose in India for centuries^[43]. The zinc present in besan fights the infections that erupt the face with acne. It also helps by controlling the excessive sebum production and soothes the inflamed skin.

38. Rose water

Rose petals and rose oil contain a number of powerful antioxidants, such as triterpenoids, saponins & flavonoids, which can help protect cells from damage^[44]. Rosewater maintains the skin's pH and it controls excessive oil secretion. The anti-inflammatory property of rose water helps to reduce the redness of irritated skin, acne, dermatitis and eczema. Being a great cleanser it removes oil and dirt accumulated in clogged pores.

39. Almond extract

Almonds due to its emollient properties, have the potential to improve both complexion and skin tone. Treats dry skin.

For centuries almonds are used to treat dry skin conditions, including eczema and psoriasis. Improves acne. They are a fantastic source of antioxidants [45].

40. Sandalwood oil

Sandalwood oil is highly preferred because of its anti-inflammatory, anti-microbial, anti-acne and anti-tanning properties. It is a go to ingredient for quick skin care routine [46].

41. Lavender oil

Lavender oil is full of antioxidants, such as linalool, linalyl, acetate, and flavonoids which help protect you from the free radicals [47]. To use lavender oil for wrinkles, use a few drops of the essential oil along with coconut oil. The mixture can be used as a moisturizer once or twice a day. It has the ability to lessen acne, help lighten skin, and reduce wrinkles.

42. Wheat germ oil

The major lipid-soluble antioxidant is vitamin E, first isolated from wheat- germ oil. Wheat germ has high levels of vitamin E [48]. Damage caused by the free radicals can be protected by Vitamin E.

43. Neem oil

All parts of Neem plant have advantages in medicinal treatments and industrial products including flower and seed oil. Neem is best known for its anti-aging properties. Due to its antioxidant properties, neem protects the skin from harmful UV rays, pollution and other environmental factors. The vitamins and fatty acids in neem improve and maintain the elasticity of the skin, reduce wrinkles and fine lines [17].

44. Grape seed extract

Grape seed extract is rich in polyphenols, specifically proanthocyanidins (OPCs), which belong to the bioflavonoid family. OPCs are strong antioxidants that when penetrated into the skin play a role in the stabilization of collagen and maintenance of elastin. It has anti-inflammatory, antimicrobial, antioxidant properties. These properties, along with the high amounts of omega chain fatty acids and vitamin E contained in grape seed oil, have made it a popular topical treatment for skin [49].

45. Beeswax

Beeswax also contains small amounts of alcohols, lactones, carotenoids, cholesterol esters and flavonoids [50]. Among the flavonoids present in beeswax. Beeswax heals and softens skin, and is an antibacterial agent. It can help you fight conditions like acne, dry skin, eczema, and stretch marks.

46. Jajoba oil

It's an antioxidant. Jojoba oil contains natural forms of vitamin E. This vitamin works with your skin as an antioxidant [51]. Healing properties of jojoba oil makes it effective in treating skin conditions like acne, eczema and psoriasis.

47. Marigold oil

Calendula oil (Marigold oil) has antifungal, anti-inflammatory, and antibacterial properties that might make it useful in healing wounds, soothing eczema, and relieving

diaper rash. Marigold has antibacterial and anti-inflammatory properties which can help in eradicating wrinkles, pimples etc [52].

48. Turmeric oil

Turmeric oil is high in antioxidant and potent anti-inflammatory compounds. The essential oil has abundant antioxidants and has anti-allergic, anti-bacterial, anti-microbial, anti-fungal qualities which works like a miracle on your skin and hair. Turmeric is a powerful antioxidant [53].

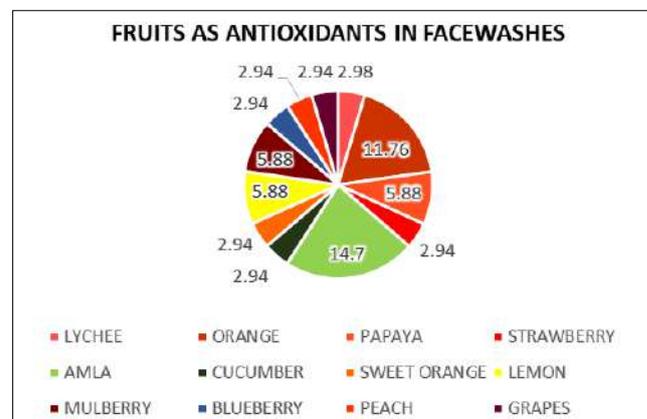


Fig 2: fruits used as antioxidants in herbal facewashes

The above figure 2 show the percentage of mostly used fruits as antioxidant in herbal facewashes.

Conclusion

For centuries natural ingredients have been used for skin care purposes. Consumers have an increasing interest in natural products, namely in the case of cosmetic products. The above article bestowed the hypothetical existence of antioxidant and encompassing its protection against cellular wear and damage. The article mainly emphasis on the importance and advantageous effects of natural antioxidants present in the face washes. Herbal antioxidants present in the herbal face washes available in indian market are particularly discussed in detail. The sources and the origin of various antioxidants have been enumerated.

Acknowledgement

We thank our principal Dr. M. Senthilkumar M. Pharm, Ph.D and our mentor Dr. L.V. Vigneshwaran M. Pharm, Ph.D, MBA, BBL, IDDDP. (Sree Abirami College of Pharmacy) for being a great support to conduct this work.

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