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Review Article

Plant Derived Antioxidant: Significance In Skin Health and Ageing Process

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ABSTRACT

Cosmetics, derived from the Greek word "kosmtikos," have evolved from ancient practices into sophisticated formulations aimed at enhancing beauty and health. This study explores the role of herbal cosmetics and plant-derived antioxidants in skin health and the aging process. Antioxidants, pivotal in neutralizing free radicals, prevent oxidative stress and cellular damage, contributing to anti-aging, skin texture improvement, and wrinkle reduction. Plant-derived antioxidants such as polyphenols, carotenoids, and ascorbic acid play a crucial role in neutralizing free radicals, which are unstable oxygen molecules that cause oxidative stress, leading to cellular damage and aging. Furthermore, this research highlights the role of natural antioxidants in combatting intrinsic and extrinsic skin aging mechanisms, including oxidative stress induced by UV radiation and environmental pollutants. Modern advancements in antioxidant cream formulations, incorporating ingredients like *Moringa oleifera*, *Jatropha multifida*, and *Euphorbia hirta*, showcase promising results in reducing oxidative damage and improving skin health. This comprehensive study underscores the importance of natural, plant-based ingredients in addressing skincare challenges while advocating for further research and clinical trials to unlock the full potential of herbal cosmetics.

INTRODUCTION

1.1 Cosmetics:

The word cosmetic was derived from the Greek word "kosmtikos" meaning having the power, arrange, skill in decorating. The origin of cosmetics forms a continuous narrative throughout the history of man as they developed. The man in

prehistoric times 3000 BC used colours for decoration to attract the animals that he wished to hunt and also the man survived attack from the enemy by colouring his skin and adorned his body for protection to provoke fear in an enemy (whether man or animal). The origin of cosmetics were associated with hunting, fighting, religion

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and superstition and later associated with medicine. The term Cosmeceuticals was first used by Raymond Reed founding member of US Society of Cosmetics Chemist in 1961. He actually used the word to brief the active and science based cosmetics. The above term was further used by Dr. Albert Kligman in the year 1984 to refer the substances that have both cosmetic and therapeutic benefits. Cosmeceuticals are cosmetic pharmaceutical hybrids intended to enhance health and beauty through ingredients that influence the skin's biological texture and function.[1] The cosmetics, according to the Drugs and Cosmetics Act is defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part for cleansing, beautifying, promoting attractiveness or altering the appearance. Herbal Cosmetics, here referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic advantages only, shall be called as "Herbal Cosmetics.[2] Herbal medicines include herbs, herbal materials, herbal preparations and finished herbal products. In some countries herbal medicines may contain, by tradition, natural organic or inorganic active ingredients that are not of plant origin (e.g. animal and mineral materials) Herbs include crude plant material, such as leaves, flowers, fruit, seeds, stems wood, bark, roots, rhizomes or other plant parts, which may be entire, fragmented or powdered. Herbal materials include, in addition to herbs, fresh juices, gums, fixed oils, essential oils, resins and dry powders of herbs. In some countries, these materials may be processed by various local procedures, such as steaming, roasting or stir baking with honey, alcoholic beverages or other materials. Herbal preparations are the basis for finished herbal, products and may include comminute or powdered

herbal materials, or extracts, tinctures and fatty oils of herbal materials. They are produced by extraction, fractionation, purification, concentration, or other physical or biological processes. They also include preparations made by steeping or heating herbal materials in alcoholic beverages and/or honey, or in other materials.[3]

1.2 Definition of Cosmetics:

The cosmetics, according to the Drugs and Cosmetics Act is defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part for cleansing, beautifying, promoting attractiveness or altering the appearance.[4]

1.3 Definition of Herbal Cosmetics:

Herbal Cosmetics, here referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic advantages only, shall be called as "Herbal Cosmetics".^[1]

1.4 Present Status:

Herbalists today, believe to help people build their good health with the help of natural sources. Herbs are considered to be food rather than medicine because they're complete, all natural and pure, as nature intended. When herbs are taken, the body starts to get cleansed, it gets purifying itself. Unlike chemically synthesized, highly concentrated drugs that may produce many side effects, herbs can effectively realign the body's defence. Herbs do not produce instant cures, but rather offer a way to put the body inproportune with nature for thousands of years, humans have used herbs. Herbs have been used in the following ways - In cooking for flavouring foods, as perfumes, as disinfectants, to protect us against germs, as medicines to heal when we are sick.[4]

1.5 Classification of Cosmetics ^[5]:



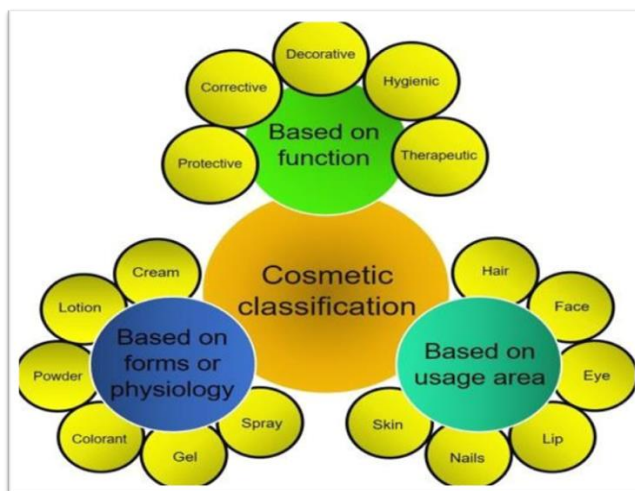


Figure: 1 Classification of cosmetics

1.6 Cream:

Creams are the topical preparations which can be applied on the skin. Creams are defined as “viscous liquid or semi-solid emulsions of either the oil-in-water or water-in-oil type” dosage forms which consistency varies by oil and water. Creams are used for cosmetic purposes such as cleansing, beautifying, improving appearances, protective or for therapeutic function. Creams are considered as a pharmaceutical product as they are prepared

based on techniques developed in the pharmaceutical industry; unmedicated and medicated creams are highly used for the treatment of various skin conditions or dermatoses. Creams can be ayurvedic, herbal or allopathic which are used by people according to their needs for their skin conditions. They contain one or more drug substances dissolved or dispersed in a suitable base. Creams may be classified as o/w or w/o type of emulsion on the basis of phases^[8].



Figure: 2 Antioxidant cream

- Make skin softer
- Reduce moisture loss
- Reduce dark spot
- Protect skin cell from sun damage

1.7 Types ^[8]:

1.7.1 Oil-in-Water (O/W) creams: which are composed of small droplets of oil dispersed in a continuous phase, and an emulsion in which the oil

is dispersed as droplets throughout the aqueous phase is termed an oil-in-water (O/W) emulsion.

1.7.2 Water-in-Oil (W/O) creams: which are composed of small droplets of water dispersed in a continuous oily phase? When water is the dispersed phase and an oil the dispersion medium, the emulsion is of the water-in-oil (W/O) type.

1.8 ADVANTAGES ^[9]:

- Antagonize excess free radicals in healthy cells
- Enhancement of host antitumor immunity
- Available in a wide variety of fruits and vegetables
- Short-lived and ultra-fast acting oxidizing biomolecules
- Cancers may also benefit from the use of antioxidants
- Antioxidants might prevent cancers than curing them
- Difficulty in delivery to tumor mass or internal organs
- Acts on DNA causing mutation and increasing cancer

1.9 DISADVANTAGES [9]:

1.10 Physiology of human skin:

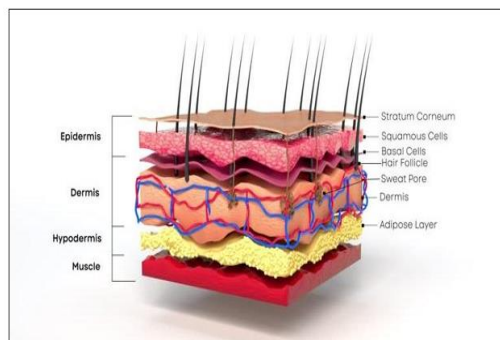


Figure 3: Anatomy of skin

1.10.1 Epidermis:

The epidermis, the skin's outermost layer, is composed of several strata and various cell types the epidermal layers are the stratum basale, stratum spinosum, stratum granulosum, stratum lucidum, and stratum corneum. The stratum basale, also known as stratum germinativum, is separated from the dermis by the basement membrane (basal lamina) and attached to it by hemidesmosomes. The cells in this layer are cuboidal to columnar, mitotically active stem cells that constantly produce keratinocytes. This layer also contains melanocytes. The stratum spinosum, comprising 8 to 10 cell layers, is also called the prickle cell layer. This layer contains irregular, polyhedral cells with cytoplasmic processes, sometimes called spines, that extend outward and contact neighboring cells by desmosomes. Dendritic cells can be found in this layer.^[24]

1.10.2 Dermis:

The dermis is connected to the epidermis by the basement membrane. The dermis consists of 2 connective tissue layers, papillary and reticular,

which merge without clear demarcation. The papillary layer is the upper dermal layer, which is thinner and composed of loose connective tissue that contacts the epidermis. The dermis houses the sweat glands, hair, hair follicles, muscles, sensory neurons, and blood vessels.^[24]

1.11 Antioxidant:

Antioxidant neutralizes free radicals, unstable oxygen molecules that break down skin cells and cause wrinkles, thus preventing impairment at the cellular level. [6] Antioxidants can be defined as any substance that, present in low concentration compared to an oxidized substrate, effectively delays or inhibits oxidation of the substrate. It is also highly interesting to find new and safe antioxidants from natural sources. Although synthetic antioxidants are very effective and stable, they have limited use in many countries due to the possibility of causing adverse effects on human health. Face cream containing antioxidant is used to protect the skin from damage and respond to the presence of free radicals. Antioxidant cream may also reduce the appearance

of wrinkles and shield the skin against damage from the sun and the environment.[7]

1.12 Antioxidant activity of plant :

Plants are a rich source of biologically active substances that significantly impact human skin health. The biological activity and active ingredient content in plants are influenced by environmental factors such as growing conditions, harvesting time, and the drying and storage methods used for herbal materials. These plants exhibit various properties, including medicinal effects for treating skin diseases and promoting overall skin health, primarily through their antioxidant effects. Key antioxidant components found in plants include polyphenols, tocopherols, carotenoids, ascorbic acid, and macromolecules like polysaccharides and peptides, along with essential oils. To assess the antioxidant properties of plant extracts and their components, several chemical methods are employed, such as radical scavenging assays (including DPPH and ABTS), lipid peroxidation assays (such as β -carotene-linoleate model systems and TBARS assays), and reduction power assays (like FRAP, CUPRAC, and PM assays).^[10]

❖ Polyphenols:

Polyphenols are a large and significant group of natural compounds found in plants, characterized by the presence of two or more hydroxyl groups attached to an aromatic ring. They can be classified into several categories, including flavonoids, phenolic acids, tannins, and stilbenes. Flavonoids, the most recognized type of polyphenols, can exist as free molecules (aglycones) or as glycosides bound to sugars. Key sources of flavonoids include onions, leeks, chicory, blackcurrants, goji berries, and green tea. Among flavonoids, anthocyanins are particularly noteworthy for their free radical scavenging abilities, with common pigments including pelargonidin, peonidin, cyanidin, malvidin, petunidin, and delphinidin, also found in fruits like grapes, elderberries, and cherries. The second group, phenolic acids, exhibit antioxidant properties, with hydroxycinnamic acids being more prevalent than hydroxybenzoic acids. These compounds are found in various fruits, particularly in the outer parts of ripe fruits like blueberries, kiwis, cherries, and plums.^[10]

Table 1. Polyphenols compounds

	Compounds	Role as Antioxidants	Benefits on skin
Flavanoids	Flavanols Flavones Isoflavanoids	Reducing properties, stabilization of unpaired electron	Use in antiageing, skin lightening product Moisturize and soften the skin
Phenolic acids	Hydrobenzoic acid derivative hydroxycinnamic acid derivatives	predominantly radicle scavenging by hydrogen atom donation	Act as photoreceptor Antimicrobial synthesis of collagen
Tannins	Hydrolysable tannins condensed tannins	Ability to scavenge radicles	Protect the skin from inflammation caused by external inflammation Antiulcer activity

❖ Carotenoids:



Carotenoids are a class of fat-soluble natural pigments, responsible for the colour of many plants, including fruits, vegetables, and flowers. Carotenoids include two main classes, namely, carotenes (consisting of carbon and hydrogen),

including α -, β -, and γ -carotene and lycopene, and their oxygenated derivatives, xanthophylls (consisting of carbon, hydrogen, and oxygen), including lutein, zeaxanthin, astaxanthin, and β -cryptoxanthin.

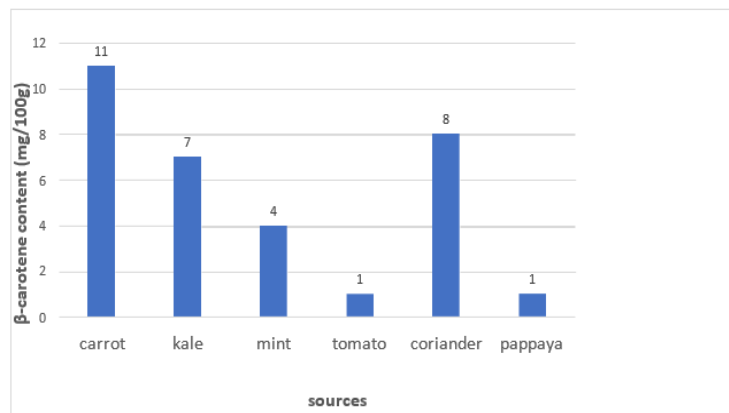


Figure 4: Selected plant source of β -carotene

❖ Ascorbic acid:

Vit C is an important and highly efficient water-soluble antioxidant. Because ascorbic acid can donate two electrons, it is a cofactor in numerous enzymatic reactions in the body. Vit C is essential for maintaining the appropriate structure and function of the skin. Ascorbic acid is found in all layers of the skin, with a higher concentration in the epidermis (3.8 $\mu\text{mol/g}$) than in the dermis (0.7 $\mu\text{mol/g}$). Fresh vegetables and fruits are excellent sources of vit C. Ascorbic acid is oxidized and transforms into the ascorbate anion. The ascorbate anion can continue the electron donation, leading

to conversion to ascorbate free radical, which in turn is converted to dehydroascorbic acid. Due to the successive electron donations, the resulting ascorbate free radical has greater stability than other free radicals and can serve as an antioxidant scavenging other radicals. Although the direct antioxidant protection provided by vit C is limited to aqueous compartments, vit C significantly prevents LPO by regenerating fat-soluble vit E. Furthermore, vit C interacts with carotenoids and antioxidant enzymes. Ascorbic acid increases the concentration of intracellular GSH, which protects protein thiol groups against oxidation.^[10]

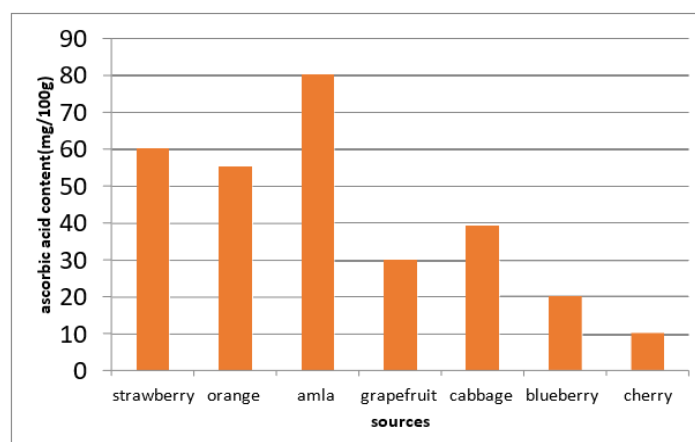


Figure 5: Selected plant source of ascorbic acid

Table 2: Antioxidant plants

Plant name	Botanical name	Significance	Pictures
Moringa	Moringa oleifera	Fight malnutrition, Important sources of plant of protein , In cosmetics .	
Amla	Phyllanthus emblica	Proves beneficial against respiratory disorder, Improve memory, immunity booster.	
Vinca	Catharanthus roseus	Cancer treatment ,High blood pressure,used as disinfectants.	
Tulsi	Ocimum sanctum linn.	Anti-inflammatory and antioxidant protect against oxidative stress, relief cough cold and bronchitis symptoms.	

❖ **Macromolecules:**

Macromolecules, such as proteins, peptides, and polysaccharides, are claimed to be health-promoting agents which can be used in medicine and in the cosmetics and food industries . These exogenous bioactive compounds serve as important organic components of the body and can regulate the redox state. Biomacromolecules can effectively remove ROS to slow ageing, protect

skin cells, inhibit melanin production, and prevent lipid oxidation, especially in polyunsaturated fat-based products. Several exogenous bioactive macromolecules have been shown to occur widely in plants. There is growing interest in peptides from plant resources. They can be obtained from herbs, fruits, seeds or leaves. Bioactive peptides (BPs) are defined as specific protein fractions (sequence of 2–20 amino acids) with positive

physiological functions. The consumption of food-derived peptides can supplement endogenous enzymatic and non-enzymatic antioxidant systems and effectively reduce oxidative stress.^[10]

1.13 OxS and Skin ageing:

Skin ageing is a natural, complex process influenced by two mechanisms— intrinsic ageing (genetic, chronological) and extrinsic ageing (photoageing). Both intrinsic and extrinsic ageing are associated with changes in the physical, morphological, and physiological properties of the epidermis and dermis. The two processes overlap and are strongly associated with an increase in free radicals and the phenomenon of OxS in the skin.^[10]

One of the main factors accelerating intrinsic skin ageing is oxidative damage to cellular structures. Skin ageing is also significantly accelerated by UVR. Both UVA and UVB radiation are important sources of ROS formation in the skin. Photo-oxidative stress caused by ROS produced in the skin under the influence of solar radiation is believed to be the main pathological mechanism causing damage to ECM proteins (responsible for the formation of wrinkles) as well as photomutagenesis of skin cells (responsible for carcinogenesis). Chronic photo-oxidative stress causes symptoms of skin photoageing, including a reduction in the number of dermal fibroblasts, the formation of collagen cross-links, protease-induced collagen breakdown, and chronic inflammation. OxS may also increase the level of elastin mRNA in dermal fibroblasts, contributing to the elastotic changes found in skin exposed to UVR. OxS results in accelerated wrinkle formation, loss of elasticity, dryness, uneven pigmentation and discoloration, telangiectasia, susceptibility to irritation, and slower wound healing. OxS may also play an important role in numerous dermatological diseases, such as psoriasis, atopic dermatitis, allergic contact dermatitis, acne vulgaris, vitiligo, lichen planus, alopecia areata, and melanoma.^[10]

1.14 Application^[11]:

1.14.1 Food Antioxidants: As consumer preferences shift towards ready-to-eat foods, there is an increased demand for antioxidants, which help protect food from spoilage and oxidation. Antioxidants, commonly derived from spices and herbs, are used in food processing, especially in products containing unsaturated fatty acids, to prevent rancidity and extend shelf life.

1.14.2 Role of antioxidants in diabetes: Diabetes is a chronic metabolic disorder marked by insulin deficiencies, leading to high blood sugar and disturbances in metabolism. It is associated with increased free radical formation and reduced antioxidant defense, resulting in oxidative damage to proteins, lipids, and nucleic acids. This oxidative stress contributes to complications in both insulin-dependent and non-insulin-dependent diabetes.

1.14.3 Role in premature infants: Supplementing antioxidants in infants, especially those born prematurely, could help reduce damage from excess reactive oxygen species (ROS) in conditions like bronchopulmonary dysplasia and retinopathy of prematurity. Enzymatic antioxidants, such as MnSOD and CuZnSOD, are lower in premature infants and can help reduce ROS-induced injury by enhancing antioxidant activity.

1.14.4 Role in food: High, well-tolerated doses of nutritional antioxidants like selenium, vitamin E, and vitamin C have immunostimulant, anti-inflammatory, and anti-carcinogenic effects. They help protect tissues from ischemia or hypoxia, and may also offer antithrombotic benefits.

2. Literature Review

1. Temel Kan Bakir *et.al*, (2024) : This study investigated lipid oxidation kinetics in four antioxidant-added skin care creams to assess their antioxidant effects on skin layers. THCl and THC2 effectively slowed lipid oxidation, while THC3 and THC4 accelerated it, as confirmed by



the DPPH scavenging method. UV-B-induced oxidation of a lecithin and Tween 20 emulsion was evaluated at 35 °C and pH 5.5, with results supported by conjugated diene absorbance and GC-MS analysis. THCl and THC2 degraded fatty acids more slowly than THC3 and THC4. The findings aim to inform consumers about costly cosmetics and guide manufacturers in providing accurate product information, with future in vivo studies planned to ensure safety for human health.^[12]

2.Christine Thevamirtha *et.al*,(2023): The aim of this study was to determine the antioxidant activity of these three cosmetic products made using the pigment oil extract by the DPPH radical scavenging activity assay. This information is crucial in determining the efficacy of these products in comparison to the popular equivalent products available in the market which will, in turn, assist with popularizing and marketing these palmyrah-based cosmetic products. Hence, a comparative study on antioxidant activity has been conducted here to fill this research gap. The cosmetics made using the carotenoid extracted from the Palmyrah fruit pulp showed remarkable free radical scavenging activity/ antioxidant activity by inhibiting.^[13]

3.IlhamiGulcin *et.al*,(2023):There's growing interest in natural antioxidants to combat free radicals, particularly in fatty foods. The DPPH (1,1-diphenyl-2-picrylhydrazyl) scavenging assay is the most popular method for assessing antioxidant activity. This review outlines the principles of the DPPH assay, emphasizing the need for standardization of experimental conditions and reaction media. It discusses previous studies that have optimized the method and adapted it for various analytes, highlighting the simplicity of the assay, where compounds or extracts are mixed with DPPH solution and their absorbance is measured. Despite advances in technology, the DPPH method remains largely

unchanged, and this study provides comprehensive insights into its applications and developments.^[14]

Rajendra Gyawali *et.al*,(2022): The aim of this study was to evaluate the phytochemical constituents and antioxidant activity of ethanolic extracts of *M. oleifera* and then develop a functional cream. The antioxidant property of the ethanolic extracts of *Moringa oleifera* L. leaves collected from Rupandehi and Makawanpur districts respectively were determined by 2, 2-diphenyl-1-picrylhydrazyl (DPPH) scavenging activity *M. oleifera* L. leaves from Makawanpur and Rupandehi were found to be rich in phenolic phytochemicals with strong antioxidant properties, exhibiting IC₅₀ values of 30.64 and 32.03 µg/mL. A cream formulated with the leaf extract showed favorable physicochemical properties, indicating potential for commercial antioxidant creams.^[23]

4.Sariya Mapoung *et.al*,(2021): This study evaluated the antioxidant activity, tyrosinase inhibitory effects, and phenolic content of commercial cosmetic creams in the Thai market. Using hot water and sonication for extraction, total.^[15]

5.Rebecca Olajumoke Oloniyo *et.al*,(2021): The aim of this study was to compare the biochemical and antioxidant properties phenolic contents ranged from 0.46 to 47.92 mg GAE/30 g cream. Antioxidant activity varied from 3.61 to 43.98 mg Trolox equivalent/30 g cream, and tyrosinase inhibition ranged from 2.58% to 97.94%. A moderately positive correlation ($r = 0.6108$) was found between total phenolic content and antioxidant activity, while a highly positive correlation ($r = 0.7238$) was observed between antioxidant activity and tyrosinase inhibition. of cream-fleshed and orange-fleshed sweet potato. OFSP is a bio-fortified variety of sweet potato with high beta (β) carotene which is a precursor of vitamin A, that is OFSP is a

provitamin A food crop. MDP showed higher antioxidant properties compared to the KJP and CFSP, thus; this will could make MDP suitable to combat micronutrient deficiency and food insecurity in Africa especially in Nigeria.^[16]

6. Navya Poulose *et.al*, (2020): This study presents the first photoprotective cream formulation using these natural ingredients, improving antioxidant and wound healing effects. A melanin- producing bacterium, *Halomonas venusta*, was isolated from the marine sponge *Callispongia* sp. and optimized for melanin production, yielding 4.92 mg/ml with 1% tyrosine. A cream was formulated with 0.25% melanin and 0.75% seaweed concentrate (*Gelidium spinosum*), both rich in antioxidants. This cream inhibited the growth of *S. aureus* and *S. pyogenes*, had a pH of 5.52, and exhibited good texture with a cooling effect on the skin.^[17]

Abidi Safia *et. al*, (2019): In view of this, present study was designed to prepare and evaluate the antioxidant & anti-inflammatory activity of cream comprising the aqueous petals extract of *Rosa damascena* for its radical scavenging and protein denaturation activity. Antioxidant activity assessed using standard ascorbic acid (ferric reducing power assay), and anti- inflammatory activity assessed using standard diclofenac sodium measuring of the %age inhibition of protein denaturation. The rose water contains the major phytoconstituents which are polyphenolic compounds flavonoids, tannins, triterpenoids, saponins which are mainly responsible for the antioxidant and anti-inflammatory properties.^[18]

7. Fadli A Gani *et.al*, (2019): The aims of this study were to formulate *E. hirta* L. extract loaded cream and to assess the antioxidant activity of loaded cream. First, *E. hirta* L. was prepared with maceration process using water as solvent (1:5). The extract was tasted for antioxidant activity using 2,2-diphenyl-1-picrylhydrazyl (DPPH) for suitable concentration of the extract

incorporated into the cream, which was 10%w/w. The one of plant extract that commonly used in the cosmetic product is *Euphorbia hirta* Linn. The herb of *E. hirta* L. extract possesses antioxidant activity that can be very promising for antiaging products. These loaded cream also had satisfactory antioxidant activity, which can be regarded as an effective and economical skincare product for topical uses.^[19]

8. Yuvianti Dwi Franyoto *et.al*, (2018): This study evaluated the antioxidant potential of *Jatropha multifida* L. stems, known for their flavonoid content. The stems were macerated in ethanol, filtered, and evaporated. Total flavonoid content (TFC) was measured using spectrophotometry, and antioxidant activity was assessed via the DPPH radical scavenging assay, yielding an IC₅₀ value of 72 ± 0.01 µg/mL. The findings suggest that *Jatropha multifida* L. extracts could serve as natural antioxidants, potentially aiding in disease prevention. A cream formulated with 5% extract using the fusion method showed promising results, indicating potential for cosmetic product development.^[22]

9. K. Makarova *et. al*, (2017): In this work we studied two types of skin creams with extracts from aronia (*Aronia melanocarpa*), elderberry (*Sambucus nigra*) and bilberry (*Vaccinium myrtillus*) because of their high content of anthocyanins, i.e. strong natural antioxidants. The studies showed high activity of all those fruits in all performed tests, but the highest antioxidant activity was obtained for aronia. ANN predicted the values of DPPH radical scavenging activity for berry extracts in w/o and o/w cream bases samples with high accuracy.^[20]

G. Marinova *et.al*, (2011): The study evaluated the DPPH method for determining free radical scavenging activity, highlighting key factors affecting accuracy, such as the choice of solvent (ethanol vs. methanol) and the sample-to-DPPH volume ratio. A modified method was proposed



for measuring the antioxidant activity in beer, utilizing a 0.06 mM DPPH solution in ethanol, with specific reaction conditions and absorbance measurement at 517 nm. Results indicated that malt significantly contributes to the antioxidant activity.^[21]

3. Aim and Objectives

Aim: Plant derived antioxidant: significance in skin health and the ageing process

Objective:

- ❑ Neutralize free radicals: Prevent oxidative stress, cell damage, and inflammation.
- ❑ Protect cells and tissues: Safeguard against damage from environmental stressors, toxins, and pollutants.
- ❑ Reduce wrinkles and fine lines: Protect collagen, elastin, and skin elasticity.
- ❑ Improve skin texture: Enhance skin firmness, smoothness, and radiance.

4.CONCLUSION:

Plant products have been used for centuries for skin care purposes. Today, the use of natural ingredients in various innovative formulations for skin care, cleaning, and Plants have a great potential to support skin care, but more research trials and clinical evidence are needed, as the effectiveness of many such extracts has not yet been confirmed. Many new aromatic and medicinal plants that improve the quality of plant-based products may be identified in future. Furthermore, many active molecules have yet to be discovered, and natural molecules derived from plant extracts are a particularly interesting subject for further research. Many new aromatic and medicinal plants that improve the quality of plant-based products may be identified in future.

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