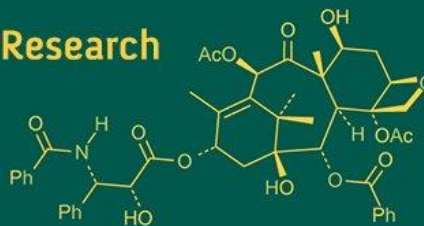


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Polyherbal cosmetic formulation of *Urtica dioica* with rose water and Multani Mitti for enhanced skin care

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Abstract

Herbal cosmetics have gained significant attention due to their safety, effectiveness, and minimal side effects compared to synthetic products. The present study focuses on the formulation and evaluation of a herbal face pack incorporating *Urtica dioica* as a key ingredient along with rose water, Multani mitti, glycerine, and papaya powder. *Urtica dioica* is rich in bioactive compounds such as flavonoids, phenolic acids, terpenoids, and sterols, which exhibit antioxidant, anti-inflammatory, antimicrobial, and anti-aging properties beneficial for skin health. The selected natural ingredients were combined to develop a face pack aimed at cleansing, nourishing, and rejuvenating the skin. Multani mitti acts as an absorbent and cleansing agent, glycerine provides moisturization and improves skin hydration, papaya powder offers exfoliating and collagen-promoting activity, while rose water soothes and tones the skin. The formulated herbal face pack is expected to remove excess oil, dirt, and dead skin cells while improving skin texture and complexion. The presence of antioxidant and anti-inflammatory constituents helps in reducing acne, blemishes, and skin irritation. Furthermore, the formulation promotes collagen synthesis, enhances skin elasticity, and provides a natural glow. The study concludes that the developed herbal face pack containing *Urtica dioica* offers a safe, effective, and economical alternative to synthetic cosmetic products and can be used for maintaining healthy and youthful skin.

Keywords: Anti-aging, antioxidant, Glycerine, herbal cosmetics, herbal face pack, Multani mitti, Papaya powder, Rose water, Skin care, *Urtica dioica*

1. Introduction

Cosmetics are products used to clean, beautify, increase attractiveness, or alter the look of the skin. Since ancient times, various plants have been used to treat, clean, and decorate them. A person's facial skin is the main part of their body that shows their health ^[1].

Despite the enduring desire for beauty, younger people today are more likely to suffer from typical skin issues such as acne, blackheads, pimples, and dark circles. Blood impurities are the root of many skin problems, according to Ayurveda, which emphasizes a holistic approach to skincare ^[2]. "Mukha lepa" is the Ayurvedic term for the herbal paste used to treat acne, pimples, scars, markings, and facial pigmentation. This herbal mixture, known as "mukha lepana," is now frequently used as a facial cosmetic technique. Additionally, the concept of a "face pack" involves applying a gentle powder to the face. Apart from enhancing the appearance of the skin, a quality herbal face pack should also penetrate the subcutaneous tissues and provide essential nutrients ^[3, 4].

Applying a smooth powder to the skin is called a face pack. These liquid or paste-based preparations are applied to the face and allowed to dry and solidify into a film that cleanses, tightens, and strengthens the skin. In order to allow the water to evaporate, they are often applied to the skin for 15 to 30 minutes. The film compresses and solidifies as a result, making removal simpler. Adsorption and colloidal clays in these preparations aid in the removal of oil and debris from the skin of the face, while the tightening and warming qualities of the face pack give the appearance of a revitalized face ^[5].

1.1 *Urtica dioica*

Urtica dioica also known as Stinging nettles are a unique and mysterious group of plants that have both captivated and scared humans for many years. The presence of histamines and formic acid in the trichomes of these remarkable plants is widely recognized for producing a stinging sensation when touched on the leaves and stems ^[6].

With ovate green leaves and unisexual green flowers in a catkin inflorescence, this plant grows to a height of 75cm [7].

1.2 Taxonomy

- Kingdom: Plantae-Plants
- Subkingdom: Tracheobionta-Vascular plants
- Superdivision: Spermatophyta-Seed plants
- Division: Magnoliophyta-Flowering plants
- Class: Magnoliopsida-Dicotyledons
- Subclass: Hamamelidae
- Order: Urticales
- Family: Urticaceae-Nettle family
- Genus: *Urtica* L.

- Species-*Urtica dioica* L.,-stinging nettle P^[12]

1.3 Geographical Location

U. dioica is essential to the biodiversity of the ecosystem because of its extensive range and position as an ecological keystone species [8-9]. Examples of this genus include *Urtica dioica* subsp. *cypria* on Cyprus, *Urtica atrovirens* on Corsica and Sardinia, *Urtica rupestris* on Sicily, *Urtica stachyoides* on the Canary Islands, *Urtica portosanctana* on Madeira, *Urtica taiwaniana* on Taiwan, *Urtica papuana* on Papua New Guinea, and *Urtica perconfusa* on New Zealand. This shows that island colonization within the genus is a distinguishing trait of flowering plants [10, 11].

Table 1: Geographical distribution, traditional uses, and pharmacology of *Urtica* species.

S. No.	Species	Geographical distribution	Traditional uses	Pharmacological activities
1	<i>Urtica dentate</i> Hand.-Mazz	North America	Kidney problems, rheumatoid arthritis, kidney calculi	Antiarthrititis, antiurolithiatic
2	<i>Urtica hyperborea</i> Jacq. exWedd.	Nepal, India, China	Skin rashes, arthritis, fungal infections	Antioxidant
3	<i>Urtica hyperborean</i> Jacq. exWedd.	China, India, Bhutan, Himalaya, Myanmar	Kidney pain. Its extract and paste kidney diseases, diabetes, fungal infections, inflammation, arthritis	Antiprotatic hyperplasia

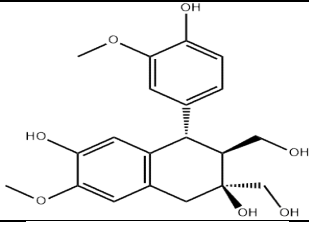
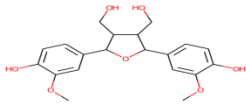
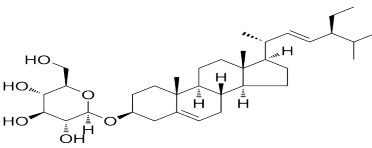
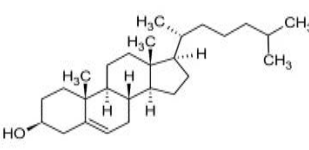
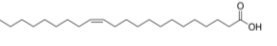
One of the most widely used medicinal plants, it is prized for its many health-promoting qualities, non-toxic nature, and accessibility [13, 14]. Several phytochemicals from the family of secondary metabolites, including as terpenes, phenolic acids, flavonoids, chlorophylls, Carotenoids, and fatty acids, are abundant in the plant [15, 16, 17, 18, 19].

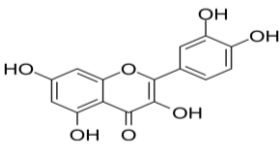
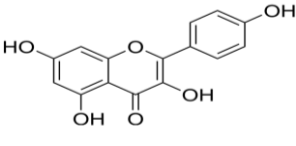
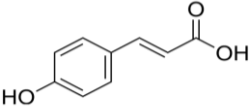
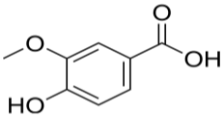
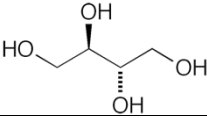
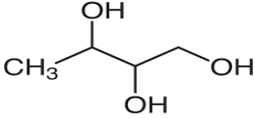
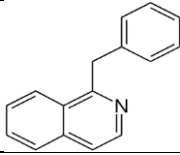
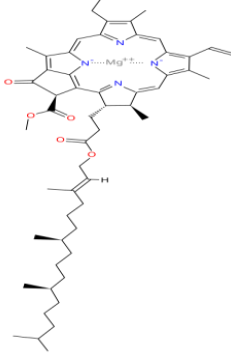
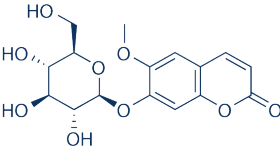
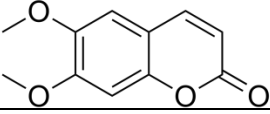
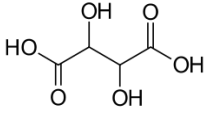
The plant is known to possess a variety of pharmacological properties [20, 21] such as antioxidant [22] anti-inflammatory,

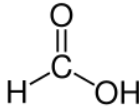
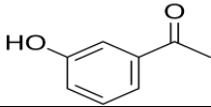
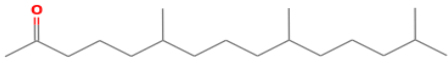
antiulcer [23] anti-colitis, antiviral [24] anticancer [25] antibacterial, antimicrobial, antifungal [26, 27, 28] ant androgenic [29], insecticide [30] immunomodulatory [31] hypocholesterolemic [32] hypoglycemia [33] cardiovascular effects [34] analgesic [35] natriuretic, hypertensive [36] hepatoprotective [37] and rheumatoid arthritis [38].

1.4 Phytoconstituents

Table 2: Phytoconstituents of *Urtica* species

S. No	Compound name	Category	Structure
1	Cyclooolivil; 9'-O-b-d-Glucopyranoside	ligans	
2	Neoolivil	ligans	
3	Daucosterol	sterols	
4	Cholesterol	sterols	
5	Palmitic acid	Fatty acids	
6	Erucic acid	Fatty acids	

7	Quercetin	Flavonoids	
8	kaempferol	Flavonoids	
9	p-Coumaric acid	Phenols	
10	Vanillic acid	Phenols	
11	Erythritol	Alcohols	
12	1, 2, 3-Butanetriol	Alcohols	
13	Benzylisoquinoline	Alkaloids	
14	Chlorophyll A	Alkaloids	
15	Scopolin	Benzopyranoids	
16	Scoparone	Benzopyranoids	
17	Tartaric acid	Other compounds	

18	Formic acid	Other compounds	
19	3-Hydroxyacetophenone	Terpenoids	
20	Hexa hydrofarnesyl Acetone	Terpenoids	

2. *Urtica dioica*

Nettle extracts are also utilized in cosmetics, and topical treatment has numerous advantages for the health of the skin (such as anti-inflammatory and anti-swelling properties). However, the anti-aging and antioxidant qualities of nettle extracts make them one of the most intriguing ingredients for cosmetic applications. Nettle has anti-aging properties because it collects a variety of scavengers of reactive oxygen species, which can reduce skin damage from free radicals [39-40]. In addition to its antioxidant properties, the anti-aging effects may also be attributed to the inhibition of

degrading enzymes like collagenase or elastase, which cause wrinkles by decreasing the suppleness of the skin [41].

The two compounds found in nettle extracts that are particularly intriguing for the development of anti-aging action are quercetin and ursolic acid [42, 43]. The well-known elastase inhibitor ursolic acid is mostly found in nettle roots [44], whereas quercetin is one of the most well-known antioxidants and is primarily found in leaves [45]. Additionally, it possesses remarkable antibacterial and antifungal qualities, making it a top ingredient for skin care [46].

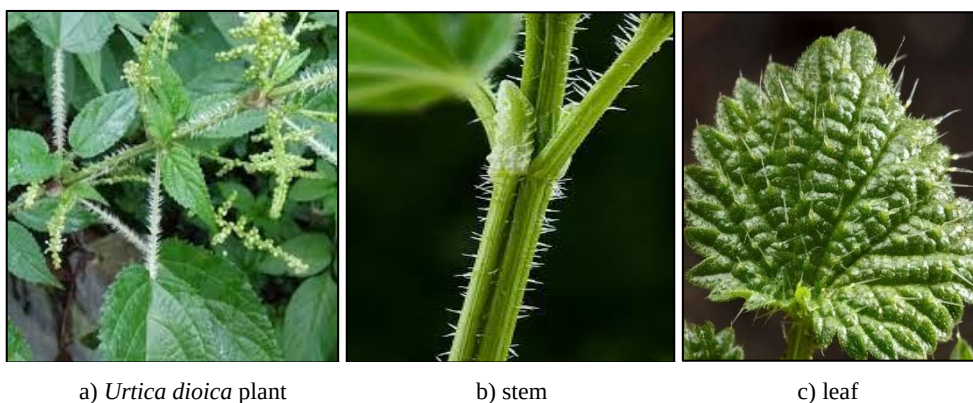


Image 1: Morphological parts of *Urtica dioica*

3. Rose Water

The oil-rich and attractive rose is one of the oldest plants. More than 100 species of vines and shrubs are found in the genus *Rosa*. Owing to its many qualities, the plant has been used in the medical and cosmetic fields [47]. As a natural humectants, it keeps the skin moisturized, smooth, and soft

by holding onto moisture. Its anti-inflammatory properties help to soothe sensitive or acne-prone skin by reducing redness, irritation, and swelling [48]. Additionally, antioxidants included in rose water shield the skin from environmental stressors and free radical damage, delaying the onset of premature aging and promoting skin repair [49].



Image: 2 Rose water and rose flowers are used as soothing agent in face pack.

4. Multani Mitti (Fuller S Earth)

Fuller's Earth, also referred to as Multani Mitti, is a multipurpose skincare ingredient that offers numerous advantages. It contributes to a smoother and more even

complexion by decreasing pore size, getting rid of blackheads and whiteheads, and erasing freckles and sunburns. With its natural cleansing qualities, Multani Mitti effectively detoxifies the skin, eliminating excess oil and

impurities while also improving blood circulation for a more radiant and healthy complexion. Rich in vital nutrients, Multani Mitti reduces blemishes and fights acne, leaving

skin cleaner and more evenly toned. Its skin-friendly qualities are further enhanced by the presence of magnesium chloride [50, 51].



a) Multani mitti

Image: 3 Multani mitti used as absorbent material in formulation

5. Glycerine

Glycerol, also marketed as glycerin, is a colorless, odorless, and viscous liquid. Glycerin is used in a wide range of industries, including the food, cosmetics, pharmaceutical, and polymer sectors [52]. Glycerin keeps the skin moisturized, smooth, and supple by retaining moisture. Due to its anti-inflammatory qualities, it can help reduce

inflammation and redness in irritated skin. Glycerin also helps in protection of the skin from environmental stressors like wind, cold weather, and dry air. By increasing the flexibility of skin, glycerin reduces the visibility of wrinkles and fine lines. Using glycerin can help brighten the skin, making dark spots and hyper pigmentation less noticeable [53].



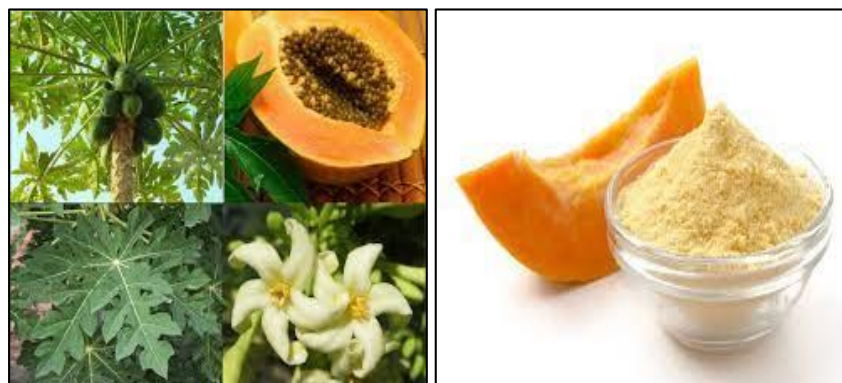
a) glycerine

Image: 4 Glycerin used in herbal face pack formulation

6. Papaya Powder

The tropical fruit known as papaya (*Carica papaya*), which belongs to the Caricaceae family, is high in dietary antioxidants such as vitamin C, tocopherols, total phenols, and β -carotene [54] as well as bioactive phytochemicals that have antioxidant properties like benzyl isothiocyanate [55]. The papain enzyme, which is present in papayas, acts as a

natural exfoliant to help remove dead skin cells and improve skin texture. It also contains vitamins A, C, and E, which nourish and protect skin. Due to its abundance of healing enzymes, it can also be used to treat sunburns and soothe injured skin. The flavonoids found in papaya powder encourage the skin to produce more collagen, which gives it a soft, firm, and supple tone. [56].



a) Papaya tree, fruit, leaves, flowers

b) papaya powder

Image: 5 Papaya plant showing tree, fruit, leaves, and flowers and powder

7. Pharmacological Properties

7.1 *Urtica dioica*

7.1.1 Antioxidant Activity: *Urtica dioica* antioxidants operate as both preventative and therapeutic agents, protecting against the harmful effects of reactive oxygen species. These free radicals have an important role in the pathogenesis of numerous diseases, including diabetes, cancer, autoimmune diseases, CDV (Canine Distemper Virus) diseases, and neurodegenerative disorders [57]. The plant's Hydroalcoholic extracts have showed considerable antioxidant properties. The extract has greater reducing power and can scavenge free radicals, superoxide anion radicals, and H₂O₂ [58]. Plant extracts have been shown to be effective at chelating metals, having a higher antioxidant potential for decreasing ferric acid than Trolox, and supplementing with *Urtica* extracts lowers the systemic potential for oxidative stress while raising plasma antioxidant capacity [59]. In addition to its antioxidant properties, the leaf extract is antilithiasic and reduces the size of calcium oxalate crystals in urine, which supports its medical application [60].

7.1.2 Antidiabetics Activity: *Urtica dioica* is known for its anti-diabetic effects. When diabetic rats were given plant leaf extracts at a dose of 250mg/kg, their blood sugar levels fell. In induced diabetes, cold methanolic leaf extract also has an antihyperglycemic action [61]. Swimming exercises followed by plant aqueous extract ingestion improved diabetic parameters, improved insulin or glucose uptake *in vitro*, and restored pancreatic tissues *in vivo* in diabetics [62]. The plant's ethanolic extract has been shown to directly alter adiposities by raising adiponectin and ceramidase activity, decreasing ceramide buildup, and increasing insulin sensitivity via increased Akt phosphorylation [63]. The role of *Urtica dioica* as an anti-diabetic drug was established using molecular docking to explore the interactions between particular enzymes responsible for diabetes mellitus type 2 (DMT2) and *Urtica dioica* phenolic compounds [64]. *Urtica dioica* hydroalcoholic extracts significantly improved diabetic rat blood glucose levels by reducing levels of GSK-3 beta and K-Ras [65].

7.1.3 Hepatoprotective Activity: *Urtica dioica* leaf extracts can help protect the liver. The recommended dosage for increased hepatoprotective action is 400mg/kg [66]. The plant's seed extract also protects against hepatic damage by increasing the activity of aryl-esterase, paraoxonase, and liver tissue catalytic activity [67]. EAF (ethyl acetate fraction) of the plant's aqueous-alcoholic extract is thought to have significant hepatoprotective and antioxidant capacity, and Ferulic acid extracted from it has hepatoprotective properties [68].

7.1.4 Hypoalgesia: The effect of *Urtica dioica* extract on memory impairment and hypoalgesia was assessed. It helps to lower blood glucose and polydipsia while also improving body weight, insulin levels, cognition, and insensate neuropathy. The findings of this plant were equivalent to those of rosiglitazone in treating long-term diabetes-induced problems such as central and peripheral neuronal dysfunction. [69]

7.1.5 Antiviral Activity: *Urtica dioica* aqueous extract exhibits a higher affinity for N-acetyl glucosamine than it does for HIV. The N-acetyl glucosamine region has been

shown to strongly suppress syncytium formation between CD4 + Molt/4 cells and HUT-78 cells infected with HIV-1 and HIV-2 [70]. At lower levels (0.5-1 micrograms/ml), the plant extract inhibits syncytia growth significantly, and the level of inhibition increases as the extract concentration increases. Cytotoxic effects were first detected at higher concentrations [71]. Agglutinin, an *Urtica dioica* lectin, was tested and found to inhibit coronaviruses such as bronchitis virus, gastroenteritis virus, feline coronaviruses I and II, torovirus, and arteriviruses [72].

Plant nutritional extract possesses anti-rotaviral activities, which are enhanced when combined with *Nelumbo nucifera* extract; consequently, retroviral-induced diarrhea is treatable [73]. The plant's methanolic preparations suppress dengue virus (DENV2) serotype 2 replication, and substances with these qualities have been identified, including kaempferol and quercetin (flavonol glycosides), chlorogenic acid, and quercetin derivatives [74].

7.1.6 Anti-inflammatory, Analgesic and Anti-arthritis Activity:

Urtica dioica leaf supplementation in Wistar rats caused NMDA (N-methyl-D aspartate) injection-induced inflammation and brain damage. Such rats have a considerable decrease in NF-KB (nuclear factor kappa B) binding capability to DNA. These findings point to a significant anti-inflammatory impact of *Urtica* leaves [75]. In the treatment of rheumatoid arthritis, *Urtica* leaf extract is utilized as an anti-inflammatory. This anti-inflammatory effect in rheumatoid arthritis occurs by suppressing cytokine production [76]. Plant leaf extracts inhibit ovalbumin-induced inflammation and lipid peroxidation in the lung tissues of asthmatic model mice, demonstrating their protective effect in airway inflammation [77]. *Urtica dioica* ethanolic leaf extract had possible analgesic action at a dose of 400mg/kg due to the presence of trimethyldecane, trimethylhexane, and methyltetradecane [78].

7.1.7 Anticancer Activity: *Urtica dioica* aqueous extract has been tested for cell cytotoxicity against breast cancer cell lines MDA-231 and MCF-7 using the XTT assay. The aqueous extract of plant roots demonstrated direct reduction of HeLa cell proliferation, preventing the connection between the epidermal growth factor and its receptor, and inhibition of globulin to its receptor, which is often dose-dependent [79]. DNA fragmentation and elevated proteins such as calpastatin, calpain 1, caspase 3, Bcl-2, caspase 9, and Bax—all linked to apoptosis—identify the plant as anti-proliferative for breast cancer *in vitro* [80]. In addition to preventing carcinogenesis, the plant as a nutraceutical food can be used to treat various cancers. Additionally, by acting as an antioxidant, cellular metabolic modulator, apoptosis inducer, and anti-mutagenetic, various plant extracts can kill cancer cells and stop their spread [81]. Changes in proliferation by modification in BAX and BCL2 expression demonstrate the dose-dependent effect of *Urtica dioica* methanolic extract on colon cancer and hepatocarcinoma cell lines [82]. IC₅₀ values for the antioxidant activity of leaf extracts point to *Urtica dioica* as a potential herbal remedy for a number of malignancies [83].

7.2 *Carica papaya*

7.2.1 Antidiabetic Activity: A study on the antidiabetic efficacy of *Carica papaya* L. leaf extract was conducted in an experimental rat model. A chloroform extract containing

steroids and quinines was administered at various dose levels to streptozotocin-induced diabetic and non-diabetic rats. After 20 days of treatment, the sacrifice was performed, and the biochemical analysis was conducted. Following treatment of *Carica papaya* L. leaf chloroform extract, diabetic rats showed a considerable reduction in serum glucose, trans aminases, and triglycerides. This study concludes that *C. papaya* leaf has potential for treating diabetes symptoms [84].

7.2.2 Anticancer activity: Initially, pharmaceutical preparations containing various proteolytic enzymes (papain) were used as adjuvants in the treatment of malignant disorders, despite a lack of understanding of their mechanism. Experiments show that the effects of oral polyezyme formulations are connected to cytokine generation by human peripheral blood mononuclear cells [85].

In vitro studies demonstrate that papaya can treat a variety of cancer cell lines and has anticancer properties. Papain, an enzyme found in papaya, is effective against cancer. Papain degrades the fibrin cancer cell wall and protein into amino acids. Other than papain, it contains lycopene, which is extremely reactive to oxygen and free radicals. Isothiocyanate is helpful against breast, lung, colon, pancreas, prostate, and leukaemia. These enzymes can prevent cancer cell growth and proliferation [86].

7.2.3 Nephroprotective Activity: In experimental rats, a study was conducted to investigate the nephrotoxicity of Pb (II) and its amelioration using *Carica papaya* L. leaf powder. Experimental rats treated with Pb(II) ions at a concentration of 1.000 mg/L i.p. showed higher levels of serum biochemical markers and oxidative stress, including SGPT, SGOT, urea, creatinine, and malondialdehyde. Pre-treatment with papaya leaf powder significantly lowered the levels of SGPT, SGOT, urea, creatinine, and malondialdehyde compared to the Pb(II) treated group. Pb(II) exposure caused significant necrosis of kidney cells and enlargement of tubular cells, while pretreatment with *C. papaya* leaf powder decreased the damaging effects. This investigation revealed that pre-treatment with *C. papaya* leaf powder antidote can prevent Pb(II)-induced nephrotoxicity in experimental rats [87].

7.2.4 Antioxidant activity: The methanolic extract of unripe *C. papaya* fruits was tested for its influence on antioxidant enzyme activities such as glutathione peroxidase (GPx), glutathione transferase (GST), glutathione catalase, and glucose-6-phosphate dehydrogenase in mice given an oral dose of 100mg/kg. The ethyl acetate fraction significantly increases the activity of glutathione reductase, GST, GPx, and glucose-6-phosphate dehydrogenase. Research suggests quercetin and β -sitosterol may play a role in antioxidant activity [88].

7.2.5 Antifertility Activity: *Carica papaya*'s anti-fertility effects were explored by feeding various fruit components to adult and pregnant rats. There was no attempt to force feed the animal, and the results showed that the unripe fruit stopped the estrous cycle and caused miscarriage. This effect was lost as the fruit became stale or overripe. In languor monkeys, chloroform extract of *Carica papaya* seeds caused long-term azoospermia. [89] Papaya also had anti-implantation and abortifacient properties [90].

7.3 Rosewater of Damascene Rose

7.3.1 Antihypertensive: *Rosa damascena* buds contain cyanidin-3-O- β glucoside, a newly discovered chemical. This chemical has the potential to greatly inhibit the activity of the angiotensin-I converting enzyme (ACE). *Rosa damascena* may help improve cardiovascular function since it inhibits ACE, a crucial enzyme in the formation of angiotensin II [91].

7.3.2 Antilipase: A recent study investigated the anti-lipase impact of numerous plant extracts, including *Rosa damascena*. The discovery confirms that the ethanolic extract of *Rosa damascena* has antilipase action [92].

7.3.3 Soothing effect: *R. damascena* preparations, including ethanolic, aqueous, and chloroformic, were utilized to soothe mice. Ethanolic and aqueous extracts at 500 and 1000 mg/kg significantly extended pentobarbital-induced sleeping time in mice, comparable to diazepam. However, the chloroformic extract did not have a relaxing effect [93]. Damask Rse, like diazepam, can lengthen the pentobarbital-induced sleep time. *R. damascena* includes flavonoids and terpenes [94]. These chemicals have calming properties [95]. As a result, it is suggested that these chemicals may be responsible for *R. damascena*'s relaxing effect. Several investigations have demonstrated that flavonoids have anxiolytic and/or antidepressant properties. Flavonoids have been considered as contributing to the relaxing effect [96].

7.3.4 Anticonvulsant effect: Flavonoids and other components of *R. damascena* essential oil, such as geraniol and eugenol, may be implicated in epileptic seizure protection, as evidenced by a substantial reduction in the mean frequency of seizures in patients taking rose essential oil. As a result, *R. damascena* essential oil contains antiepileptic properties that benefit children with refractory seizures [97, 98].

7.3.5 Antioxidant and anti-inflammatory effects: *R. damascena* possesses antioxidant properties. The antioxidant activity of this plant's hydroalcoholic extract of petals and essential oil was also assessed using DPPH to measure free radical scavenging activity and the ferric ammonium thiocyanate technique to assess lipid peroxidation properties. However, the presence of quercetin 3-O-glucoside and other flavonoids in the extract may explain the potential for this impact [99]. Damask Rose demonstrated powerful antioxidant and lipid peroxidation inhibitory effects comparable to Vitamin E, implying that the rose could be used to cure and prevent various free radical disorders. The rose also includes vitamin C, which has antioxidant and anti-inflammatory properties [100]. A recent study examined the impact of a rose-flower extract on the mortality rate of *Drosophila melanogaster*. The study also discovered anti-aging effects of the flower, implying that *R. damascena* can lengthen *Drosophila* life span without disrupting physiological systems [101].

7.4 Fuller's Earth [102]

1. Anti-Acne Property: Multani Mitti is well-known for its ability to treat acne. Its natural absorbent characteristics assist in eliminating excess oil and pollutants from the skin, hence reducing breakouts.

2. **Anti-Inflammatory Properties:** It has anti-inflammatory properties, making it useful for soothing and calming irritated or inflamed skin. This feature can assist to minimize redness and swelling.
3. **Astringent Activity:** Multani Mitti is an astringent that tightens and tones the skin. It can help to reduce the appearance of pores and improve skin texture.
4. **Absorbent Property:** One of its most notable characteristics is its absorbent tendency. Multani Mitti quickly absorbs excess sebum, leaving the face feeling refreshed and oil-free.
5. **Antibacterial Property:** It contains natural antibacterial characteristics that can help prevent bacterial growth on the skin. This is very useful for acne-prone skin.

7.5 Glycerine

7.5.1 Skin: According to studies, glycerin relieves dry skin, restores the skin barrier, and aids in wound healing. Glycerin is a good moisturizer since it is both a humectant and an emollient, which means it draws moisture into your skin while also soothing the surface layer^[103]. When applied topically, glycerin lubricates the skin's outer layer (epidermis) to keep water in and prevent dryness^[104].

7.5.2 Digestive System: Glycerin is used to enhance digestion and bowel movement. It is used as a laxative by enema. People who are constipated prefer to include glycerin in their diet. This glycerin-rich delivery irritates the anal mucosa, causing the bowels to absorb more water (hyperosmotic action) and resulting in smooth bowel movement^[105].

7.5.3 Soothes Irritation: Applying glycerol to disorders such as eczema, psoriasis, rash, or dry skin can form a barrier that seals in moisture and aids healing while also reducing your desire to itch! Because of its moisturizing properties, glycerol is used in a variety of cosmetic soaps and compounds. It also aids in the relief of inflammatory skin problems and excessive irritation^[106].

7.5.4 Suppress Rough Skin: Glycerin can also help smooth rough skin. Rough skin, such as cracks, is thought to develop when the amount of water in the stratum corneum (the outermost layer of skin) reduces by 10% or less as a result of UV rays and dryness. Glycerin has a moderate viscosity and penetrates the stratum corneum, leaving the skin feeling moist. Its high water absorption moisturizes the skin and reduces roughness. Glycerin is good for all skin types^[107].

7.5.5 Healing Properties: Glycerin has the ability to accelerate the healing process. It stimulates the natural development of skin cells. Glycerin has traditionally been used to treat wounds, scrapes, and blemishes. Consuming pure glycerin can also help to speed up the healing process in the body.

8. Conclusion

Stinging nettle, or *Urtica dioica*, is a significant medicinal and cosmetic plant that is well known for its abundance of bioactive substances, such as flavonoids, phenolic acids, terpenoids, and sterols, all of which contribute to its amazing therapeutic and skincare advantages. It is good for

both internal health and external skin care because of its potent antioxidant, anti-inflammatory, antidiabetic, hepatoprotective, and anticancer qualities.

Rose water, Multani mitti, glycerine, and papaya powder are natural ingredients that work well together to create a herbal face pack that revitalizes, nourishes, and purifies the skin. This mixture helps prevent blemishes, acne, and pimples while eliminating extra oil, debris, and dead skin cells. Additionally, it increases skin suppleness, encourages the production of collagen, and amplifies the skin's inherent radiance. Thus, herbal face packs based on *Urtica dioica* offer a natural, safe, and environmentally responsible substitute for synthetic cosmetics, promoting healthy, glowing, and youthful-looking skin without any negative side effects.

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