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Review Article

Herbal Face Wash Tablets: Formulation Development, Quality Evaluation, and Emerging Perspectives — A Comprehensive Review...!!

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ABSTRACT

A crucial aspect of skin care, face washing means the scrubbing of the clinical inflammatory detritus and sebum, any pollutants, and other detritus from the surface of skin. However, in addition to the common liquid and gel face cleansers, there is concern about preservatives, packaging waste, transportation, and environmental friendliness, and new cleaning formulations are emerging. Recently, solid dosage forms of face cleaning have been formulated by adding plant bioactive material in the herbal face wash tablet. Such formulations have potential advantages of easy application (on dissolution or dispersion in water), easy to transport, less packaging, and better shelf life. Herbal ingredients such as aloe vera, Azadirachta indica, Curcuma longa, Camellia sinensis, and Centella asiatica may provide additional benefits such as antioxidant, soothing effect, antibacterial activity, and skin-conditioning activity. Herbal face wash tablets involve computer-aided excision of cleansing agent, herbal extracts, disintegrant, binder, lubricants, and other excipients so that the tablet has the mechanical strength, is compatible with the skin, disintegrates, and cleanses. Quality evaluation is essential for characterization of physicochemical properties, hardness, friability, disintegration, pH, foaming power, cleansing efficiency, stability, microbiological quality, and skin irritation.

INTRODUCTION:

1.1. Facial Cleansing and Skin Hygiene:

Cleansers remove dead skin cells, makeup, other impurities, excess oils/sebum, perspiration, and debris from the skin. Facial wash is a topical cosmetic formulation for mechanico- and physico-chemical removal of the unwanted moiety from the skin surface and preserving the homeostasis of the skin. When properly cleaned, it promotes the hygiene of the skin by reducing accrual of impurities and by helping to preserve the epidermal barrier. [1&2] Some parts of our human skin protect our body by means of the external surfaces. The stratum corneum is the outermost layer

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of the epidermis which maintains the skin's moisture, controls transepidermal water loss, and protects the skin from environmental irritants. Therefore, face cleansers should be able to remove impurities without disrupting the structural order of the stratum corneum [1]. The cleansing action has been attributed in the main to the surface-active agents or surfactants in modern facial washing agents. They possess both hydrophilic and lipophilic moieties and are thus able to interact with water and oily contaminants. In this way, surfactants help to solubilize the sebum or other hydrophobic pollutants into rinsable micellar bodies by reducing the interfacial tension [1,2]. However, improper surfactant systems or excessively harsh washing conditions may compromise skin barrier function by stripping off essential epidermal lipids and natural moisturizer [1].

1.1.1 Historical background:

1. **1813–1823 — Michel Eugène Chevreul:** Michel Eugène Chevreul, a French chemist, researched the chemistry of fats and oils. His research increased the understanding of fatty substances, their fatty acids, glycerol, and the chemistry of soap making. These investigations provided a deep scientific basis for modern lipid chemistry and soap making [5].

2. **James William McBain:** In December 1905, chemist James William McBain introduced the term "micelle" into surface and colloid chemistry [...] to describe the aggregates of soap molecules in aqueous solution. The idea was useful for the evolution of scientific knowledge of surfactant behavior and the action of modern facial cleansers [6].

3. **1930s — George S. Hartley:** Unfortunately, his work contributed to our understanding of micellar structure and aggregation of surfactants. His work resulted in structural models of micelles that are all important in explaining the removal of oily impurities in cleaning [6].

4. **Twentieth century—Development of synthetic detergents.** The emergence of synthetic detergents and synthetic detergent bars (syndets) was a significant innovation in skin cleansing. They allowed the preparation of cleansing systems with different surfactant compositions and pH more tolerable to the skin than the usual alkaline soaps [1,2].

5. **Twenty-first century—Herbal and solid cosmetic cleansing:** The growing demand for herbal ingredients, concentrated formulations, and better packaging is moving the cosmetics space toward herbal cleansing powders and bars and tablet-based cosmetics. Recently, herbal face wash tablets have emerged as a formulation approach that combines botanical ingredients with solid cosmetic manufacturing technology [7]. Thus, from empirical washing the science of face cleansing progressed to mechanistic description of surfactant action, micelle formation, and skin barrier interactions. Chemical and physicochemical basis of the modern field of preparations of cleaning agents (LeBlanc, Chevreul, McBain, Hartley). Modern facial cleansers of today are based on these scientific advances to thoroughly and gently remove impurities [1, 2, 6].

1.2 Importance of Facial Cleansing in Skincare and Skin Health: [1-5]

i. Washing your face is very important for clean skin and purity of the skin. It removes impurities such as dirt, dust, sweat, excess sebum, and other residues accumulated on the skin.

ii. Cleaning the skin regularly prevents irritating deposits and residues that irritate the skin.

iii. It removes excess oil and balances the skin.

iv. Cleansing your face gets rid of dead skin and rejuvenates your face with a fresh, clean look.

v. Gets rid of the impurities that cause clogged pores and an acne problem. Maintains the barrier and balance of the skin.

vi. These face cleansers are gentle on the skin and also preserve the moisture content of the skin so that the skin does not dry out and get irritated.

vii. Washing your face will allow your skin to absorb the moisturizers and other skin products.

viii. Using the right face wash for your skin type will greatly improve the health of your skin.

1.3 Conventional Facial Cleansers: Types, Formulations, and Limitations:

Commercial facial cleansers are sold as soaps, cleansing bars, liquid face washes, gels, creams, foams, and micellar cleansing waters. They typically have surfactants, solvents, viscosity modifiers, preservatives, fragrances, and other excipients, depending on the purpose of use and skin type to be treated. The cleaning efficiency of these products depends to a large extent on the composition and concentration of surfactants and their physicochemical properties [1, 2]. Liquid and gel face cleansers are easy to apply, spread quickly, and have good formulation flexibility. They contain water and may require suitable preservation technologies (e.g., antimicrobial preservatives) to prevent microbial contamination during storage or use. Such containers and transport of water-containing products can add, therefore, to the usage of materials, to the weight of the products, as well as to the cost for the environment. These concerns have led to the development of concentrated, water-reduced, and solid cosmetic compositions [3,5]. Nevertheless, conventional face cleansers are still used because of their demonstrated cleaning power, availability for production, and popularity among consumers. We should not sacrifice conventional products simply because they are not skin-friendly but rather find characteristics specific to conventional products to mind their limitations. Novel washing modalities should be sought with increased skin-acceptable features, increased friendliness to the environment (including type of water used for washing, water consumption, wastewater effects, and type of containers to hold products), increased conveniency of application of products, increased formulation resilience, and with still no compromise of cleaning power.

1.4 Emergence of Herbal and Plant-Based Cosmetics:

The need for plant materials and natural ingredients is leading to the production of herbal cosmetics and plant-based skincare products. Herbal cosmetics are cosmetics that incorporate plant materials, botanicals, essential oil, or isolated phyto-constituents for cleansing, massaging, moisturizing, soothing, antioxidants, and other skin conditions [2]. The phytochemical composition of the medicinal plants such as polyphenols, flavonoids, terpenoids, tannin, saponins, alkaloids, and other physiologically active components [3,4] can justify the use of medicinal plants in skin care. Natural products have long been used in cosmetics. The use of botanicals in traditional cosmetic practices (in Egypt, China, Greece, India, and elsewhere) for skin care, cleansing, beauty, and scent is well known. In the 20th century, spiked synthetic and chemically altered components found their way into cosmetic items' formulations. However, the growing consumer interest in natural ingredients in the 90s and early 21st century stimulated cosmetic manufacturers to search for plant-derived ingredients for modern cosmetic products. [3,4] Additionally, botanicals can be irritating and/or may cause an allergic reaction in susceptible patients. Standardization of extracts, safety, stability, and authentication of the botanicals should therefore be considered in the formulating of the herbal cosmetics [3,4].

1.5. Evolution of Herbal Face Wash Tablets: Herbal face wash tablets are a relatively new development in dermo-cosmetic formulation technique. They have been described in the light of a transition from conventional liquid formulations and traditional treatments to a modern era of concentrated, water-reduced, and solid cosmetics. Traditionally, plant materials were used in cleansing solutions in the form of powders, pastes, decoctions, and plant extracts. Such preparations were usually made at the moment and intended for the particular use or kept in some proper vessels and containers for possible further application. With the development of cosmetic technology, botanical elements could now be transformed into more comfortable and reproducible dosage forms [3, 4].

1.6. Concept, Composition, and Development of Herbal Face Wash Tablets:

Table 01: Components of Herbal Face Wash Tablets and Their Functional Roles

Sr. No.	Component	Functional Role
1	Herbal extracts or powders	Provide botanical constituents with potential antioxidant, soothing, antimicrobial, or skin-conditioning properties.
2	Cleansing agents	Facilitate the removal of excess sebum, dirt, and surface impurities from the skin.
3	Binders	Improve powder cohesion and enhance the mechanical strength of the tablet.
4	Disintegrants	Promote tablet breakup and dispersion upon contact with water.
5	Diluents	Improve bulk properties and support uniform tablet formation.
6	Lubricants	Reduce friction during tablet compression and ejection from the die.
7	Glidants	Improve powder flow and facilitate the manufacturing process.
8	Humectants	Help maintain skin hydration and improve the sensory feel of the formulation.
9	Fragrances and other additives	Enhance the fragrance, sensory characteristics, and overall consumer acceptability of the formulation.

Herbal face wash tablets are solid preparations that contain herbal materials, suitable excipients, and cleansing agents. They are formulated to dissolve or disperse in water or on the skin (moist) as a facial cleanser. A type of solid-state or granulated face cleanser tablets. These can be formulated with powdered herbal extracts, surfactants, binders, disintegrants, diluents, lubricants, as well as other appropriate excipients. The formula should have enough mechanical strength to be stored and transported and sufficient disintegration, dispersion, cleaning, and skin friendliness when applied.

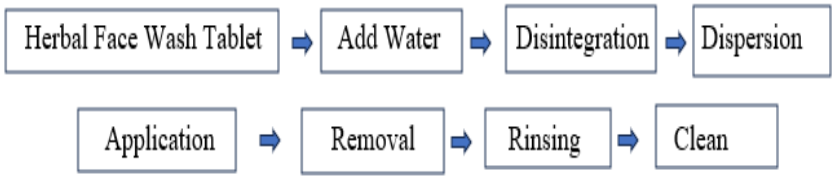
1.7. Advantages and Potential Challenges:

1. **Portability:** Tablets are small and easy to carry around, and they're road-friendly when traveling.
2. **Less Water:** Facewash products contain more water by nature than tablets do, and less water may be utilized in the creation and transport of tablets.
3. **Less Plastic:** Tablets can be recyclable/biodegradable as well, not requiring plastic bottles.
4. **Convenience:** Tablets are much more convenient to use for dosing formula. Spill/Leak-Proof: Tablets are spill and leak-proof for transportation and storage.
5. **Herbs for Skin**: Herbs in phytochemicals may be good for skin (anti-microbial, probiotic, and soothing).
6. **Flexibility of Formulation:** The formulation can be variable; the differences in the detergents and herbs and the other disintegrants and binders can work well for the type of skin and the cleansing requirement.
7. **Low-Moisture:** The tablets can be specially formulated and packed with low moisture to increase shelf life.
8. **Convenience:** Tablet form can be dissolved in water and is easier to store than liquid facial cleansers.

2. Fundamentals of Herbal Face Wash Tablets:

Face wash tablets are a novel approach for face-washing that mixes classical cosmetic proprietary principles with an effective and practical (solid and compact) dosage form and contains herbs and other plant-derived components. Such formulations are designed to remove sebum, dirt, sweat, dead skin cells, and other surface contaminants without damaging the skin. Compared to the traditional fluid face wash, herbal face wash tablets are dry, compressed and preferably compacted formulations that are dissolved by water before application. Properties of herbal face wash tablets: Herbal face wash tablets ordinarily comprise powdered botanicals combined with a combination of surfactants, binders, disintegrants, and other excipients for performance as well as improved stability and ease of use and tenderness to the skin. They can be formulated with little water, require small packaging, are extremely portable, and provide the opportunity to incorporate skin-soothing, antioxidant, or conditioning botanical constituents. So, to prepare herbal face wash tablets, we also need to

know about formulations, skin physiology, and facial wash principles. [1-4]



Flowchart No. 01: Conceptual representation of the preparation and application of herbal face wash tablets.

2.1. Classification of Facial Cleansing Formulations:

Formulas also have faces: their physical character, ingredients, washing methods, and methods and manner of application. Proper washing depends on the skin type, cleansing needs, sensory properties, and compatibility with the barrier. Common cleansers come in gel, liquid, cream, foam, or solid form. Alternative face cleansing has also gained popularity; not only tablets and powders. The solid cleaning category includes herbal face wash tablets, which are meant to be activated by water prior to use. [1–8]

Table 02: Classification of Facial Cleansing Formulations

Sr. No.	Type of Formulation	Description	Major Characteristics
1	Liquid face wash	Aqueous or surfactant-based liquid preparation.	Convenient application, easy spreading, and ready-to-use formulation.
2	Gel face wash	Semisolid formulation containing suitable gelling agents.	Viscous consistency, controlled application, and suitable sensory properties.
3	Cream cleanser	Emulsion-based cleansing preparation.	Provides cleansing with an emollient effect; often used for dry,, or sensitive skin.
4	Foaming cleanser	Formulation designed to generate foam during application.	Facilitates distribution of cleansing agents and removal of surface impurities.
5	Soap-based cleanser	Cleansing formulation containing fatty acid salts.	Effective cleansing but may produce a relatively alkaline environment.
6	Syndet cleanser	Formulation containing synthetic detergent surfactants.	Can be designed for improved mildness and skin-barrier compatibility.
7	Powder face wash	Dry mixture of cleansing agents and botanical powders.	Requires water for dispersion and application.
8	Herbal face wash tablet	Compressed or compacted solid formulation containing herbal ingredients and cleansing agents.	Unit-dose convenience, portability, and water-activated cleansing.

2.1.1 Classification based on formulation composition [09-14]

Facial cleansing products can also be classified according to the nature of their cleansing agents.

1. **Soap/soap cleansers:** Alkali salts of fatty acids. They produce good foam or lather but are generally more drying or irritating (depending on formulation and use).
2. **Syndet cleansers:** These have synthetic detergents, such as sodium cocoyl isethionate, sodium lauryl sulfate, or other anionic, amphoteric, or nonionic surfactants in them. They can be effective and mild or not, depending on the surfactant system and concentration and their interaction with the skin.
3. **Herbal/botanical cleansers:** Formulations containing plant powders, extracts, and/or other agents of plant origin as cleansing agents. Botanicals can play a role but may not produce a safer or more effective product.

4. **Cleansers:** Often use botanicals with traditional cleansing actives to cleanse and can claim skin conditioning or antioxidants. Huber: Traditional botanical facial cleansers. [1, 2]

2.2 Mechanism:

Explanation: When dissolved in water, the herbal face wash tablet liberates its messenger herbal agent and surfactants. The surfactants lower the surface tension between the water and the fatty impurities such as the secreted sebum, dirt and traces of make-up and facilitate emulsion and solubilization of the same. The softened impurities are then rubbed off and rinsed out with water. Depending on the herb used for the phytochemicals, there may also be added antioxidants or conditioning properties for the skin. [09-11]

2.3 **Advantages and Limitations of Herbal Face Wash Tablets:**[09-14]

2.3.1. Advantages:

1. **Easy:** The herbal face wash tablets are very small and simple to use.
2. **Less Use of Water:** They use less water as compared to the conventional liquid face washes.
3. **Same Amount in Each Tablet**: Each tablet gives you the same amount of the cleansing combination.
4. **Shelf Stable (Kinda):** Maybe if dry, it could resist degradation in some of the waters.
5. **Bonus Botanical:** This would be antioxidants/ soothing/antimicrobial/conditioning, in the case of added botanicals.
6. **Spill-proof:** A solid won't leak during transport. Needs less packaging than liquids.
7. **Eco-friendly:** Fewer waters to pack and ship.
8. **Convenient:** Easy to carry, store and use.
9. **Unique:** Not gel or liquid but a unique way to wash your face.

2.3.2. Limitations [09-14]

1. **Moisture Sensitivity:** This also affects the hardness, disintegration, and stability of the tablet from moisture.
2. **Compression Issues:** There may be issues with well compression and flow of herbal powders during tablet compression.
3. **Disintegration Problems:** It may be necessary to optimize tablets to disintegrate rapidly and uniformly.
4. **Plant Variability:** Chemical composition of plants may vary based on type of plant, harvest conditions, and extraction route.
5. **Irritation/Allergy:** Certain plant constituents and surfactants can be irritating/allergic.
6. **Sensory Problems:** Trace ingredients may not provide the desired color, smell, and jelly-like properties.
7. **Packaging Issues:** Packaging must act as a moisture barrier for the quality of the product.
8. **Formulation Challenges:** To optimize the hardness, friability, and disintegration properties of the formulation.
9. **Manufacturing Challenges:** It is difficult to achieve high uniformity of the herbal powders and extracts.
10. **Research Gap:** There is a need for research on the generic standard methods of the formulation, stability, cleaning effect, and compatibility with the skin.

3. List of Plants Used in Herbal Face Wash Tablets: [16-25]

Table No. 03: List of medicinal plants used in herbal face wash tablet formulations

Table 04: Quality Evaluation of Herbal Face Wash Tablets

Sr. No.	Common name	Botanical name	Family	Plant part used	Reported cosmetic properties
1	Neem	Azadirachta indica A. Juss.	Meliaceae	Leaves	Antimicrobial, antioxidant, and skin-purifying properties

Sr. No.	Common name	Botanical name	Family	Plant part used	Reported cosmetic properties
2	Sandalwood	Santalum album L.	Santalaceae	Heartwood	Soothing, fragrance, and skin-conditioning properties
3	Turmeric	Curcuma longa L.	Zingiberaceae	Rhizome	Antioxidant, antimicrobial, and anti-inflammatory properties
4	Aloe vera	Aloe vera (L.) Burm.f.	Asphodelaceae	Leaves (gel)	Moisturizing, soothing, and skin-conditioning properties
5	Tulsi	Ocimum tenuiflorum L.	Lamiaceae	Leaves	Antioxidant and antimicrobial properties
6	Orange	Citrus sinensis (L.) Osbeck	Rutaceae	Peel	Antioxidant, fragrance, and skin-conditioning properties
7	Liquorice	Glycyrrhiza glabra L.	Fabaceae	Roots	Soothing, anti-inflammatory, and skin-brightening potential
8	Rosemary	Salvia rosmarinus Spenn. (syn. Rosmarinus officinalis L.)	Lamiaceae	Leaves	Antioxidant and skin-conditioning properties
9	Sweet flag (Vasambu)	Acorus calamus L.	Acoraceae	Rhizome	Traditionally used for its aromatic and antimicrobial properties
10	Soapnut (Reetha)	Sapindus mukorossi Gaertn.	Sapindaceae	Fruit pericarp	Natural saponins with cleansing and foaming properties

4. Quality Evaluation of Herbal Face Wash Tablets:[25-29]

Table 05: Biological and Cosmetic Activities of Herbal Face Wash Tablets

Sr. No.	Evaluation Parameter	Description
1	Organoleptic Properties	Evaluation of color, odor, appearance, and texture.
2	Weight Variation	Determination of uniformity in tablet weight.
3	Thickness and Diameter	Measurement of tablet dimensions.
4	Hardness and Mechanical Strength	Evaluation of tablet strength and resistance to breaking.
5	Friability	Assessment of resistance to abrasion and mechanical damage.
6	Disintegration Time	Determination of the time required for tablet breakup.
7	Wetting Time and Dispersion Characteristics	Evaluation of wetting and dispersion in water.
8	pH of the Reconstituted Formulation	Measurement of pH for skin compatibility.
9	Foaming Ability and Foam Stability	Assessment of foam generation and persistence.
10	Cleansing Efficiency	Evaluation of the removal of dirt, oil, and impurities.
11	Skin Compatibility and Irritation Potential	Assessment of skin irritation and compatibility.
12	Antioxidant Activity	Evaluation of free-radical scavenging potential.
13	Antimicrobial Activity	Assessment of activity against selected microorganisms.
14	Moisturizing and Skin-Conditioning Properties	Evaluation of hydration and skin-conditioning effects.
15	Microbial Quality and Preservative Effectiveness	Assessment of microbial contamination and preservative performance.
16	Stability Studies and Shelf-Life Evaluation	Evaluation of physical, chemical, and microbial stability during storage.

5. **Biological and Cosmetic Activities of Herbal Face Wash Tablets.**[30-34]

Sr. No.	Type of Formulation	Description	Major Characteristics
1	Liquid face wash	Aqueous or surfactant-based liquid preparation.	Convenient application, easy spreading, and ready-to-use formulation.
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8	Herbal face wash tablet	Compressed or compacted solid formulation containing herbal ingredients and cleansing agents.	Unit-dose convenience, portability, and water-activated cleansing.

6. Challenges and Research Gaps:

6.1. Standardization of Herbal Extracts:

The variation in the quality and therapeutic efficacy of extracts with the species, plant parts, extraction methods, solvents, and processing conditions is the most important problem in standardization of herbal extracts. Absence of adequate quality standards results in variations in safety and efficacy of herbal products. Therefore, physicochemical evaluation, phytochemical screening, and marker-compound analysis are the requirements for the replication of the quality and repeatability of herbal products.[35&36]

6.2. Variability in Phytochemical Composition:

Geographical location, climate, nature of soil, season, time and stage of harvesting, and storage conditions are the basic factors affecting phytochemicals of herbal plants. Such variations may impact the biological activity and quality of herbal products. For batch-to-batch consistency, active ingredients need to be identified and suitable chemical markers selected within acceptable limits of phytochemical variability. [35&36]

6.3. Formulation Stability and Ingredient Compatibility

Storage may lead to changes in some of the physicochemical properties such as colors, odors, pH, viscosity, and appearance of the herbal formulations. Interactions between herbal extracts and other constituents of a formulation may also have an impact on stability, safety, and efficacy of the product. Therefore, compatibility studies, accelerated stability testing, and long-term stability studies are needed to establish the shelf life of finished products and to determine the appropriate storage conditions.[37&38]

6.4. Reproducibility of Manufacturing Processes

Herbal formulas should have the reproducibility of efficacy and quality. Variation in source materials, extraction methods, formulation process, processing temperatures, and equipment may result in differences between batches. Good manufacturing practices (GMP) and validated manufacturing processes and standard operating procedures can be implemented to guaranty batch-to-batch uniformity and ensure massive-scale production. [35&36]

6.5. Lack of Standardized Evaluation Methods

Without standard methods of analysis, results may not be easily compared across studies. Analytical techniques, pharmacological tests, and acceptance criteria are essential to prevent the occurrence of inconsistent results in this regard. Thus, validated analytical methods and standardized pharmacological assays and acceptance criterion parameters are important to minimize variability and improve reliability, repeatability, and comparability of research results. [35&36]

6.7. Regulatory and Safety Considerations

Herbals are regulated in terms of quality, safety, efficacy, labeling and manufacturing. Safety issues are microbial contamination, pesticide residues, heavy metals, contamination, allergies, and interactions. Herbal products require intense safety evaluations, quality-control tests, and compliance with legal requirements to ensure quality and safety. [34-40]

7. Emerging Trends and Future Perspectives.[41-47]

7.1. Formulation Development Using QbD: Quality-by-design (QbD) facilitates the formulation optimization of herbal face wash based on quality, stability, consistency, and performance [41].

7.2. Green Extraction Methods: Innovative extraction methods involve minimal use of solvents, time, and environmental harm [42]. They also facilitate the extraction of essential phytochemicals. **7.3. New Natural Surfactant Systems:** Plant-based natural surfactants can provide environmentally friendly alternatives to synthetic detergents for herbal face wash products [42]. **7.4. Skin Type-Specific and Personalized Face Washes:** Formulations designed for oily, dry, sensitive, and acne-prone skin can enhance cleansing performance and user experience [42]. **7.5. Microbiome-Friendly Face Wash:** The next generation of face washes can clean dirt and excess sebum without damaging the skin barrier and even help develop a healthy skin microbiome [45].

7.6. Technology of Tablets Manufacturing and Packaging: Tablets can be produced with new moisture-resistant packaging technology to ensure better uniformity, stability, convenience, and shelf-life [46].

7.7. Commercialization and Translational Research: More research into safety, stability, clinical, and consumer studies is needed to commercialize safe and effective herbal face wash products [41-47].

SUMMARY AND CONCLUSION:

8.1. Summary:

Herbal ingredients, appropriate cleansers, and therapeutic excipients in face wash tablets: A novel concept of face wash tablets. In this paper, we describe about recent advances regarding standardized face wash formulations, definition of herbal face wash tablets, its formulation, benefits of herbal face wash tablets, methods of preparation, evaluation parameter, and future perspectives. Advantages of tablets over the traditional liquid/gel cleanser: leak-proof, unit dose, easy to carry, low moisture content, and possibly more eco-friendly packaging. Phytoconstituents (natural product constituents) of traditional medicinal plants such as Azadirachta indica (neem), Curcuma longa (turmeric), Aloe vera, Ocimum tenuiflorum (tulsi), Centella asiatica, and Camellia Sinensis (green tea) can be used as the anti-oxidants, soothing agents, anti-microbials, anti-inflammatory agents, and skin conditioners. Such botanicals have to be carefully chosen and standardized for the preparation of safe, effective, and reproducible formulations. These optimal quantities also must involve other excipients to confer strength and homogeneity, dispersion, cleansing efficacy, etc., from binders and lubricants to disintegrants and cleansers, etc. Organoleptic properties; weight, size, diameter, etc.; hardness; friability; disintegration; wetting; dispersion; anti-bacterial and antioxidant activity; biomass cleansing; skin compatibility; foaming ability; pH; and stabilities study will be required for the evaluation of herbals face wash tablets, and so on. However, issues such as non-homogeneous phytochemical contents, moisture-sensitivity, incompatibility of ingredients, manufacturability, and non-standardized evaluation techniques need to be addressed. Progress is possible in this field with the new approaches and new trends such as Quality by Design (QbD), green extraction methods, moisture-proof packagings, skin type-based compositions, and plant-based surfactants. However, these formulations must

be thoroughly tested to ensure their safety, efficacies, stability, and consumer acceptance.

8.2. Conclusion:

Herbal face wash pills are an interesting alternative to face wash with medicinal plants by creating a face wash extraction or formulation more true-to-face wash in a convenient form rather than a tablet dosage form possibly more sustainable. They may have potential benefits of portability, fixed dosage, no wastage, and possibly less packaging waste. For medicinal herbs (neem, turmeric, aloe vera, tulsi, green tea, etc.), they may offer any additional skin conditioning or antioxidant benefits apart from cleansing action only. These may differ with the ingredient, formulation, and experimentation. A successful development should include proper selection of herbal extracts and proper excipients, easy production processes, and effective quality-testing. However, standardization of botanical ingredients and testing of herbal formulations for skin compatibility and microbiological safety and short- and long-term stability studies are also very important to ensure consistent product quality. Use of new formulation technologies as well as environment-friendly production and packaging technologies may also enhance usefulness and sustainability of such products.

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