

MULTIFUNCTIONAL HERBAL EXCIPIENTS: AN EFFECTIVE METHOD FOR HERBAL COSMETIC FORMULATIONS**Onkar Pradip Ghorpade^{1*}, Pavan Mahendrasing Patil¹, Ms. Kalyani Uttam Chande²**¹Students, Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune-411044.²Assistant professor, Dr. D.Y. Patil College of Pharmacy, Akurdi, Pune-411044.

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1] ABSTRACT

In traditional era there are herbal excipient are considered as an inert material that works as a carrier or filling materials. However, modern pharmaceutical science has proved that the excipients contribute to improving the performance of formulation, there stability. It plays key role in becoming cosmetics effective. Multifunctional herbal excipient can demonstrate the multiple functions such as stabilization of pharmaceutical product, preparation of emulsifying base, controlled delivery enhancement, etc. Due to the multiple functions in single excipient, it minimizes the complexity of pharmaceutical product and make it more acceptable for patient. In this article we cover the concept, classification, functions, various applications, current trends of excipient in cosmetic manufacturing.

KEYWORDS: Multifunctional Excipients, Herbal Excipients, Concept of Herbal Excipients, Skin Penetration Enhancement, Modifying Bioavailability.

2] INTRODUCTION

The herbal cosmetic formulation consists of two main portions that is excipients and active herbal ingredients in which major part constitutes of excipient.^[1] A label indicating that the product contains addressed excipient herbal excipient is in traditional era considered an inactive material, but nowadays it attributes the performance and stability of product.^[2,8]

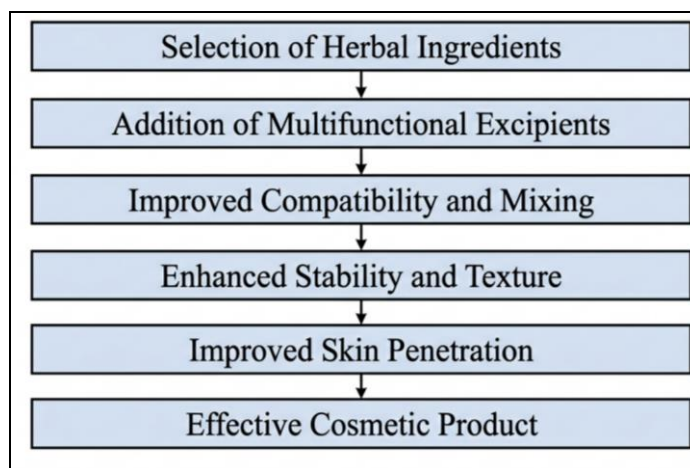


Fig. 1: general principles of Multifunctional Herbal Excipients.

Pharmaceutical and herbal Studies are describing the importance of multifunctional herbal excipients. Which enclose together multiple roles in single material, therefor it leads to the higher efficacy as well as minimizing incompatibility.^{3,5} In those days higher demand of natural and safer cosmetic products which fulfilled by the help of multifunctional herbal excipients.^[2,6]

3] CONCEPT OF MULTIFUNCTIONAL HERBAL EXCIENTS

Multifunctional herbal excipients term refers to the substance which able to fulfil the demand of more than one excipient within a cosmetic formulation. It acts as suspending agent, emulsification, stabilizer as well as helpful in penetrating skin simultaneously.^[3]

While preparing herbal formulation these excipients are derived from natural sources such as plants gums, mucilage's, essential and volatile oil etc which produce both stability as well as therapeutic purpose. These techniques are widely used for the purpose of improving the therapeutic activity and lowering the additional unwanted toxic effects.^[8]

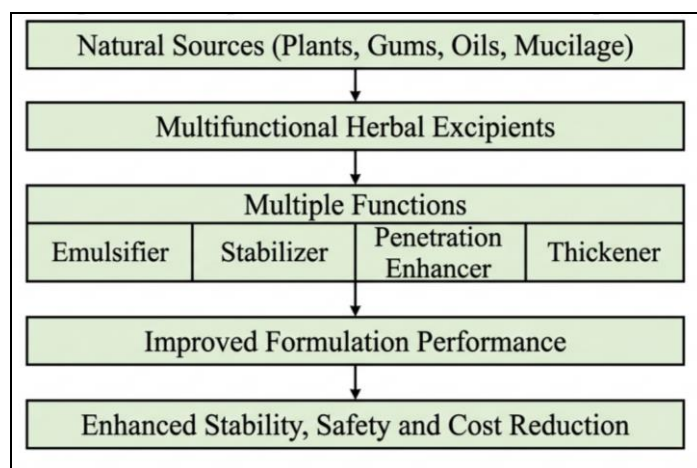


Fig. 2: Concept of Multifunctional Herbal Excipients.

4] CLASSIFICATION OF MULTIFUNCTIONAL HERBAL EXCIPIENTS

4.1 Fat Derived Excipients

Semi-synthetically we collect the excipients which containing the lipid such as fatty acids, triglycerides and herbal oils which plays various role in emollient effect, penetration enhancement and stabilizing purpose.^[4,13] In herbal cosmeceuticals there are many herbal oils such as almond oil, coconut oil which useful for enhancement of stability, improve the solubility.^[18]

4.2 Excipient Derived from Artificial Polymeric Units

In this system it includes the carbomers, some analogues of cellulose and their derivatives, it contains polymer-based structure it helps to achieve the proper thickness. These ingredients are helpful improving texture and produce and produce prolonged activity.^[9]

4.3 Agents Performing Emulsifying and Surfactant Activity

The primary work of surfactant is increasing shelf life of the biphasic dosage form and increase their pouring capacity. It capable to improve their cleansing property.^[20] For skin compatibility while preparing the herbal preparation there are widely uses the natural surfactants like saponins.^[10,21]

Class	Examples	Functions
Fat-derived excipients	Coconut oil, Almond oil	Emollient, penetration enhancer
Polymer-based excipients	Cellulose, Carbomers	Thickening, controlled release
Emulsifiers/Surfactants	Saponins	Emulsification, cleansing
Co-processed excipients	Modified starch blends	Multi-functional performance
Natural excipients	Gums, marine polysaccharides	Stability, eco-friendly, bioactivity

Fig.3: Classification system of multifunction additives.

4.4 Composite Natured Herbal Excipients

Where normal excipients provide only one function while Co-processed herbal excipients fulfil the demand of multitargets. In herbal formulation multifunctional are used to enhancing the shelf life of plan-based cosmetics.^[3,5]

4.5 Excipients Belonging from Natural Source

The plant source and the marine source are the major sources which commonly used in herbal cosmetic formulation. The bioavailability, safety and multiple capability. Simultaneously these herbal products are ecofriendly, it does not produce any harm to environment.^[6,28]

5] Functions of Excipient in Herbal Cosmetics

5.1 Decrease the Rate of Reaction and Make more Stable

Multifunctional excipients block the process of phase separation by overcoming the interfacial tension as well as enhance the rheological nature of it. It helpful for stabilize the cosmetic emulsion.^[9,19]

5.2 improving the skin penetration

Some herbal excipients can interfere with stratum corneum leads to the increase the pore size of membrane, which enhancing the skin permeability. It is derived from herbal product it does not have any harmful adverse effect. So, it is better for herbal cosmetics.^[12]

5.3 Increasing the Release Kinetics

Multifunctional herbal excipients able to provide the controlled release of herbal medicaments with increased therapeutic activity and due to natural origine it is safer than other.^[25]

5.4 Improving the Texture and Appearance

Multifunctional herbal excipient plays a wide role in smoothening the texture, easily application as compared to other it more publicly acceptable due to its simplicity.^[22]

5.5 physiological efficacy

Research shows that major phytoconstituent have greater biological activity such as some act as antioxidants, some act as anti-inflammatory, etc. It increases overall performance of herbal cosmetics.^[7,24]

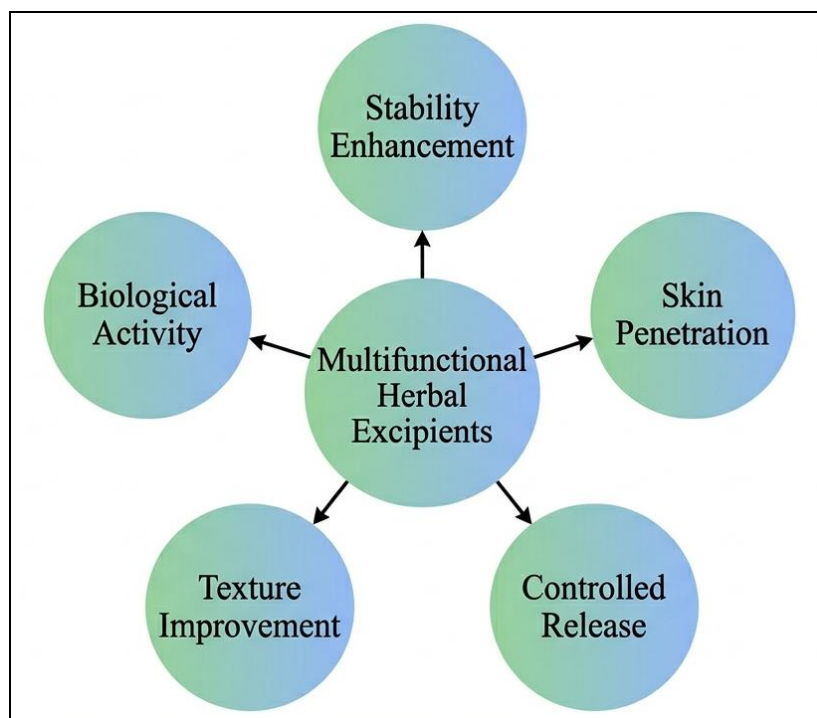


Fig.4: function of natural multiple functioning excipients.

6] Practical Significance

In advanced herbal drug delivery system multifunctional excipients are widely used. They include nano novel herbal formulations, liposomes, etc.^[13,17,34] These multipurpose herbal drug delivery systems increase the stability, unlock the controlled medication release.^[5,23] For enhancing the bioavailability and skin penetration of herbal cosmetic products that nanotechnological approach are more suitable.^[16,23]

7] Benefits of Multifunctional Herbal Excipients

Overcomes the burden of multiple additives, reduce physical degradation, Managing Incompatibility, enhanced biological and therapeutic performance, reducing processing and production cost.

These are some advantages of multifunctional herbal excipients which becoming it on of the most useful in herbal cosmetics.^[1,8]

7.1 Barriers and Demerits

Multifunctional herbal excipients are very useful as far is consist of some limitations such as validation process and complicated nature of method includes it.^[18,23] variations in herbal phytoconstituents and higher degradation rate make it more challenging.^[6]

Benefits	Limitations
Reduce number of excipients	Variability in natural sources
Improve stability	Complex validation process
Enhance bioavailability	Risk of degradation
Eco-friendly	Standardization issues

Fig.5: Benefits and Limitations.

8] Regulatory Selection Criteria

While preparing herbal cosmetic by using the multifunctional excipients, maintaining the regularity conditions are must require. It is priority need of the rational herbal cosmetic formulation. As we know every herbal product give multiple action then evaluation is compulsory needed.^[2,18]

9] Emerging Trends

9.1 Persistent Excipients

Herbal research system allows the longer acting multipurpose excipient as well as it supports the formation of core components for the cosmetic products.^[6]

9.2 Nanoscale Methodology

Nanoscale technology deals with the nanoparticle based herbal drug delivery system which is helpful for overcoming the uncontrolled toxicity and undesired adverse effects.^[16,34]

9.3 Auto Stabilizing Nature

Additionally multifunctional herbal excipients belong to the herbal category, so it has the self-filled antibacterial properties. It makes the excipient as well as cosmetic product long lasting. It highly cost effective due to the no need of preservative.^[7]

10] Utility In Cosmetic Formulations

Multifunctional herbal excipients are used in herbal cosmetic for various purpose as follow; Manufacturing of creams and lotions, manufacturing of sunscremes, preparation of antiaging products, hair care product, etc.^[22,29]

11] Overall Summary and Conclusion

In everyday life we commonly use the synthetic product or those products which containing the hazardous chemicals as a form of additives. In cosmetic preparation containing higher concentration synthetic excipients which damages the tissues of skin. In these situations, if we use the herbal multifunctional excipients, it provides multiple functions. It overcomes the product formulation cost and overuse of toxic excipients.

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