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Formulation and Evaluation of Herbal Buccal Patches of Guava Leaves and Turmeric Powder

Ms. Tamboli Kashyab I[1], Ms. Shinde Swaranjali G[2], Ms. Khaladkar Shraddha M.[3], Ms. Kulwade Pranali A.[4].
Samarth Institute of Pharmacy, Belhe, Junnar, Pune, India
swaragshinde17@gmail.com

Abstract: *Mucoadhesive drug delivery system is a distinct advantage over the traditional dosage forms such as, tablet, gels and solution etc. In the Mucoadhesive buccal patch for systemic drug delivery of drug like flavonoid which is isolated from the leaves of Psidium guajava in which system avoid first pass effect of hepatic metabolism. The buccal patch shows desired physicochemical and mechanical properties. The patches were evaluated for their physical properties like moisture content, flatness and thickness, weight variation, percentage elongation-break test. The physical properties of the prepared batches did not show any significant variations (p>0.05) and were found to have good physical integrity. Stability studies showed that the physical and chemical properties of the tested batches were not altered significantly and all the test formulations were found to be stable. The evaluation tests of fresh and aged transdermal patch showed no significant effect on drug release.*

Keywords: Carbopol 940, mucoadhesive buccal patch, HPMC K15, Psidium Guajava, Quercetin, Turmeric powder

I. INTRODUCTION

Amongst the various routes of drug delivery, oral route is perhaps the most preferred to the patient and the clinician alike. However, per oral administration of drugs has disadvantages such as hepatic first pass metabolism and enzymatic degradation within the GI tract, that prohibit oral administration of certain classes of drugs especially peptides and proteins. Consequently, other absorptive mucosae are considered as potential sites for drug administration. The biological surface can be epithelial tissue or it can be the mucus coat on the surface of a tissue. If adhesion is to a mucous coat, the phenomenon is referred to as mucoadhesion. The use of mucoadhesive polymers in buccal drug delivery has a greater application.

The oral cavity is viewed as a convenient and easily accessible site for the delivery of therapeutic agents. Sobero, the discoverer of nitroglycerine, noted absorption of drugs through oral cavity as early as 1847 and Walton and Lacey first reported systemic studies of oral cavity absorption in 1935. Since then, substantial efforts have been focused on drug absorption from a drug delivery system in the particular region of oral cavity. Since the early 1980s there has been renewed interest in the use of bioadhesive polymers to prolong contact time in the various mucosal routes of drug administration. The ability to maintain a delivery system at a particular location for an extended period of time has great appeal for both local as well as systemic drug bioavailability. Drug absorption through a mucosal surface is efficient because mucosal surfaces are usually rich in blood supply, providing rapid drug transport to the systemic circulation and avoiding degradation by gastrointestinal enzymes and first pass hepatic metabolism.

The plant Curcuma longa Linn (Zingiberaceae) commonly called as Indian saffron. The whole plant of turmeric mainly rhizomes, roots and leaves are used for medicinal purposes. Rhizomes and roots are playing an important role in ayurvedic and unani medicines. In the latter half of the 20th century, Curcumin was identified as responsible for most of the biological effects of turmeric. The rhizomes contain curcuminoids, curcumin, dimethoxy curcumin, bis-desmethoxycurcumin, 5′ methoxy curcumin and dihydrocurcumin which are found to be natural antioxidants. The fresh rhizomes also contain two new natural phenolics, which possess antioxidant and anti- inflammatory activities and two new pigments also.

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Plant profile:

1)Guava Leaves:

Synonyms: Psidium Guajava, Peru.
Biological source: Psidium guajava Linn is also known as guava leaves.
Family: MYRTACEAE.
Chemical Constituents:
Carbohydrates, fat, ascorbic acid, gallic acid, phenolic compound.
Geographical areas -
India, Indonesia, Pakistan, Bangladesh, and South America.

2) Turmeric powder

Synonyms: Curcuma, Haldi, Curcumin.
Biological source: it contains the rhizome of curcuma longa.
Family: ZINGIBERACEAE
Chemical Constituents: Curcuminoids, Demethoxycurcumin.
Geographical areas:
India is a leading producer and exporter of turmeric in the world. Andhra Pradesh, Tamil Nadu, Orissa, Karnataka, West Bengal, Gujarat, Meghalaya, Maharashtra, Assam are some of the important states cultivates turmeric, of which, Andhra Pradesh alone occupies 35.0% of area and 47.0% of production.

Taxonomical Classification:
I) Turmeric Powder-
Kingdom-Plantae

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Subkingdom-Phylum
Class- Liliopsida
Subclass- Zingideridae
Order-Zingibearales
Family- Zingibearaceae
Genus-Curcuma
Species-Curcuma

II) Guava Leaves powder-
Kingdom-Plantae
Subkingdom- Myrtoidae
Class-Magnoliopsida
Subclass- Rosidae
Order-Spermatophytina
Family- Myrtaceae
Genus-Psidium
Species-P. Guajava

II. CONCLUSION

The buccal mucosa offers several advantages for controlled drug delivery for extended periods of time. The mucosa is well supplied with both vascular and lymphatic drainage and first-pass metabolism in the liver and pre-systemic elimination in the gastrointestinal tract are avoided. The area is well suited for a retentive device and appears to be acceptable to the patient. With the right dosage form design and formulation, the permeability and the local environment of the mucosa can be controlled and manipulated in order to accommodate drug permeation. Buccal drug delivery is a promising area for continued research with the aim of systemic delivery of orally inefficient drugs as well as a feasible and attractive alternative for non-invasive delivery of potent peptide and protein drug molecules. However, the need for safe and effective buccal permeation/absorption enhancers is a crucial component for a prospective future in the area of buccal drug delivery.

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