Advances in Bioresearch
Adv. Biores., Vol 17 (6) June 2026: 139-145

Print ISSN 0976-4585; Online ISSN 2277-1573
Journal's URL: http://www.soeagra.com/abr.html
CODEN: ABRDC3
DOI: 10.15515/abr.0976-4585.17.6.139145

Advances in Bioresearch

ORIGINAL ARTICLE

Novel Fast Dissolving Buccal Film for Rapid on Set and Improved Patient Compliance

Darshan Nasit* and Khushboo Lavania
Department of Pharmaceutical Technology, Parul Institute of Pharmacy and Research, Parul University, Vadodara, Gujarat, India.
***Corresponding Author**: Darshan Nasit
Email: darshannasit07@gmail.com

ABSTRACT
Recently, strategies for delivering drugs that dissolve quickly have become more popular and accepted as new ways to give drugs. These systems aim to make a drug molecule safer and more effective by placing it into a common oral dosage form for dispensing and obtaining better patient compliance. Some companies came out with stronger delivery methods that allow for fast-dissolving drugs. The film is placed either on the top or bottom of the tongue, and it dissolves immediately at contact. The drug is released and becomes dissolved in saliva. When the saliva is swallowed, some of the drug can be absorbed in parts of the mouth, pharynx, and esophagus but before it reaches to the stomach. In this situation, it increases the absorption of drugs, poses no risk of choking, and feels wonderful in the mouth. A fast-dissolving medicine delivery device to solve the problem of having trouble swallowing pills, capsules, and other things. This review article talks about the progress that has been made in the oral dosage forms, their use, formulation considerations, how they are made, how they are evaluated, the products that are on the market, and the patented technologies that are used to make oral fast dissolving films
Keywords: *Features High solubility, high permeability, FDF for patient compliance Fast dissolving buccal film, Buccal drug delivery, Rapid onset of action*

Received 24.03.2026 **Revised 01.04.2026** **Accepted 11.04.2026**

How to cite this article:
Darshan Nasit and Khushboo Lavania. Novel Fast Dissolving Buccal Film for Rapid on Set and Improved Patient Compliance. Adv. Biores. Vol 17(6) 2026. 139-145

INTRODUCTION

Most efficient way administer a medicine with a systemic effect is by mouth. Approximately 60% of all formulations are solid. The most common dose form is the tablet. Tablets are easy to manufacture, transport, and the patient will probably be more compliant with the directions of use.[1]. Geriatric, pediatric, and bedridden patients typically find the conventional oral dosage form to be problematic. To address the issue, there was an innovative dosage form developed, oral quick dissolving films. The fast dissolving films (FDF) evolved from transdermal patch technology, which is an oral drug delivery device that delivers the medication into the body through the mouth. This drug delivery device a thin film can be easily placed on the patient's tongue or mucosal tissue. The film is rapidly wetted by any residual saliva and then dissolves promptly. The fast dissolving films assist patients in overcoming key barriers to medication adherence, such as swallowing and patient/caregiver knowledge regarding safe and effective oral medication delivery. The film rapidly wetting, dissolving, and delivering the medicine, before disintegrating and dissolving to release the drug for absorption through the oral mucosa. [2][3]. And film has a 2 large surface area and absorbs water almost instantly upon contact, which destroys the film layer immediately. The fast dissolving film formulation is made from hydrophilic polymers that disintegrate rapidly in the oral cavity and release the drug into the mouth, where it can be absorbed through the buccal mucosa and enter circulation. These dosage forms represent development of drugs with significantly high first-pass metabolism and low dosage. The need for this form is to improve bioavailability.[5].

Definition of FDF:

Among solid dosages, FDF are considered the most sophisticated solid dosage form because its adaptability. Compared to dissolving tablets, it enhances the utility of the API dissolving in the oral cavity for a limited time of less saliva, after contact in the oral cavity.

Special feature of FDF [6] :

- Films have optimal thinness and lightness, and can also be customized in a variety of visual ways.
- Easy and discreet to use, as they can be given without drawng attention from others.
- Must dissolve or decompose quickly when placed in the mouth.
- Must produce quick drug release for rapid onset of action.

Advantage [3-8] :

- Provides accurate and flexible dosing.
- Can be taken dry without chewing or water.
- Compact size means better patient acceptance and compliance.
- Provides a more rapid onset of therapeutic action.
- Offers improved stability of the formulation.
- Can effectively mask unpleasant drug taste.

Disadvantages:

Due to the hygroscopic nature of films, they should be stored in a dry environment.

- They are frequently fragile and brittle.
- Sufficient protective packaging must be used to allow stability and safety

Oral film formulations are not suitable for incorporation of drugs with high dosing requirements.[1].

Oral mucosa:

The uppermost layer, the stratified squamous epithelium, makes up the oral mucosa. The epithelium resembles the stratified squamous epithelia of the rest of the body in containing mitotically activelayerof basal cells, overlying several layers of: Flattened cells (polyhedera layer), which in turn are covered by secretory product derived by the sub epithelial cells of mesenchymal (connective tissue) element.[8].

Table:1 A Comparative Analysis of FDT And FDF [9]

Fast Dissolving Film (FDF)	Fast Dissolving Tablet (FDT)
Large surface area, they dissolve more rapidly and enhance drug release.	Smaller surface area leads to comparatively slower dissolution.
Films are flexible, thin, and mechanically stable.	Tablets are more fragile and prone to breaking compared to films.
Suitable only for low-dose drugs; films generally have a thickness between 0.015–0.05 inches.	Can accommodate higher doses; tablets are similar in size to conventional solid tablets.
Provides better patient acceptability and ease of use.	Patient acceptability is lower than that of films.

Formulation Consideration:

The FDF that is the formulation should allow drug loading in the range of 1- 20 cm. The maximum dosage of the medication is 30 mg in a single dose. It is generally accepted that all the excipients used in the quick-dissolving film are safe (GRAS-listed) and approved for used in oral strips. According to reports, formulation considerations were crucial factors influencing the films' mechanical qualities.[10][11].

Active Pharmaceutical Ingredient:

Fast-dissolving films can typically accommodate 1-30% w/w of active drug substance. However, high-dose drugs 4 are difficult to formulate into fast dissolving films, so they are probably not suitable for high dose active pharmaceutical ingredients. Micronized drug particles are especially beneficial because they facilitate improved film texture, even more rapid dissolution and improved drug content uniformity. A diverse number of therapeutic agents can be delivered successfully through orally dissolving film systems.[1][2][12].

Table:2 List of several medication that can be added to quick dissolving film is provided below [9][13].

Drug	Therapeutic Use
Azatadine Maleate	Antihistamine
Loperamide	Antidiarrheal
Ondansetron	Antiemetic
Salbutamol	Antihistamine / Bronchodilator
Omeprazole	Proton pump inhibitor
Famotidine	Antacid
Ketoprofen	Analgesic
Nicotine	Helps in smoking cessation

Film Forming Polymers:

Polymers are the backbone of fast dissolving oral films since their selection will directly affect the mechanical strength, flexibility, and the final performance of the strip. Their versatility leads to their application in both pharmaceutical and nutraceutical products. Polymers account for approximately 45% w/w of the final dry weight of the film. Hydrophilic consultations of the polymers used, aid in the disintegration of the strip rapidly when in contact with saliva, to liberate drug rapidly in the mouth.[14].

Ideal Property in Film Forming Polymer:

Selection of polymer is critical for foods. Ideally the polymer will be non-toxic, non-irritant, safe when given orally, hydrophilic as rapid disintegration would be favored, and have reasonable film-forming abilities so that the polymer has good strength and flexibility. Good wetting and spreading qualities to ensure uniformity are required when preparing the film. Finally, a cost-effective, commercially available polymer is needed to support mass production. Polymers with low molecular weight are preferred. It needs to last long enough. The polymer needs to be colorless and tasteless. It should not cause the oral mucosa to become infected again. It should exhibit suitable tensile, peel, and shear characteristics. Nowadays, quick-dissolving films are made from both natural and manmade polymers. Many natural and synthetic polymers are now available for use in the production of fastdissolving films.[1][2][6].

Table:3 The polymers utilized to make the fast-dissolving film [15]

Sr. No.	Natural Polymers	Synthetic/Semisynthetic Polymers
1	Pullulan	HPMC
2	Pectin	PVA
3	Sodium alginate	Carboxymethylcellulose (CMC)
4	Starch / Gelatin	PVP
5	Xanthan gum	Hydroxyethyl cellulose (HEC)

Plasticizers:

The composition of oral strips contains an important component, plasticizer Plasticizers are particularly important for fast dissolving films since they contribute to the mechanical properties by improving both tensile strength and elongation, and consequently last longer, with better consistency and less brittleness. Generally, the decision in selecting a plasticizer mainly depends on the compatibility of the selected polymer with the plasticizer and solvent utilized during the casting stage in the formulation of oral strips.[1][16].

Sweetening Agent:

Sweetening agents are a vital ingredient of orally disintegrating products as they improve the taste acceptability of the product. Both natural and synthetic sweeteners are used in fast dissolve films to improved palatability and to mask unpleasant drug taste. Sweetening agents can be used alone or in combination with one another, depending upon the formulation specifications. In general, sweetening agents are added in concentrations at 6% to 3% w/w of the total formulation. [2] [17].

Saliva Stimulating Agent: Saliva-stimulant agents are part of fast-dissolving film formulations in order to enhance salivary flow to allow for faster disintegration in the oral cavity and drug release. Food-grade acids such as citric acid, malic acid, lactic acid, and ascorbic acid are typically used alone or in combination in fast-dissolving film formulations. Since they are inherently hydrophilic, they are used in concentrations of typically 2% to 6% w/w of the film along with sweeteners, not just to improve taste, but also as salivary stimulants, to help dissolve the film earlier.[3][6][18].

Surfactant:
Surfactants have a significant role in fast dissolving oral films as solubilising, wetting and dispersing agents. Their presence ensures film dissolution in a few seconds, allowing for rapid release and absorption of the API. Many surfactants used oral strip formulation, with Poloxamer 407 being one of the most recognized examples as a suitable surfactant due to its dispersion, wetting and solubilizing properties.[11][19]

Flavouring Agent:
The type of flavoring agents used in fast dissolving films 7 is dependent on the specific characteristics of the drug used within the formulation. Flavor is influential with patient acceptability, since the flavor is the first thing the patient will experience within 10 seconds of product administration, and the aftertaste can persist for as long as 10 minutes. The type and amount of flavor to be used in production has to be optimized to effectively mask any undesirable drug taste and to facilitate optimal patient acceptance. intensity of the flavors is also used to determine how many flavors you need to mask the flavors. A 9-10% w/w (flavors) concentration of the flavouring component is used within the formulation.[12][20].

Colouring Agent:
Fast-dissolving films usually include approved coloring agents to enhance their visual appeal and patient acceptability. Only colorants approved under Food, Drug, and Cosmetic (FD&C) used in formulations, usually under 1% w/w. Among the colorants commonly used today, titanium dioxide is frequently available as the primary coloring agent in oral film formulations.[21][22].

Techniques for Preparing FDF: The following techniques can be used to create a film that dissolves quickly.

1 The method of solvent casting
2 The method of semisolid casting
3 The rolling motion technique [4][6][9].

Solvent Casting Process: entails dissolving A solution of water-soluble polymers is prepared using a suitable solvent, followed by the medication and additional excipients. The two solutions are combined and stirred, then they are finally poured into the Petri plate and left to dry. 1. Polymer Dissolution: A polymer is first dissolved in a volatile solvent to start the process. The polymer's solubility and ease of evaporation should be taken into consideration while selecting the solvent. 2. Solution Preparation: To form a homogenous solution or "dope," additional components such as plasticizers, additives, or active pharmaceutical ingredients (APIs) may also be dissolved in the solvent with the polymer. 3. Casting: The solution is then dispersed or cast onto a flat surface, such as a glass plate or a belt, to generate the required film shape and thickness. By adjusting the solution's viscosity and the casting procedure, the film thickness can be adjusted. 4. Drying: After the solvent has evaporated, the cast film goes through a drying process that leaves behind a solid film. The drying process may have several phases and temperatures to make sure that all the solvent is gone and the film stays stable. 5. Film Processing: Depending on the usage, the film could be further treated once it has dried, removed from the casting surface, cut into the proper sizes and shapes And Film formed [9][24].

Semisolid casting method:
The technique of semisolid casting utilizes a solution of a water-soluble film-forming polymer, and the film-forming polymer is mixed with a solution of an acid-insoluble polymer, such as cellulose acetate butyrate or cellulose acetate phthalate, and dries to form a gel-like mass. A suitable plasticizer is added to provide the proper flexibility and mechanical properties. The gel is cast, as films or ribbons, at a controlled temperature, using a drum, to produce uniform thickness. Film casting should be done between a thickness of 0.015 inches and 0.050 inches, and to obtain desirable film properties, the ratio of film forming polymer to acid-insoluble polymer should be 1:4.[17][18].

Rolling technique:
Drug solution or suspension preparation: The solvent system in which typical examples API either dissolved or dispersed: Water or ethanol or isopropyl alcohol mix with water. The medicine is mixed with softeners, sweeteners, flavoring agents, and film-forming polymers to make a uniform suspension or solution. Adding to the carrier belt: The solution or suspension is rolled or added in continuous fashion, either to a carrier belt which is a flat piece of stainless steel or Teflon. Rollers or movable blades are used to control the applied layer's thickness. Drying and Rolling: The coated layer is either passed through a drying tunnel or beneath a series of heated rollers. These rollers help the film spread and dry uniformly. A homogeneous, thin coating is created by drying, which also removes the solvent (alcohol or water). Formation and Cutting of Films: A flexible, solid coating forms on the belt when the solvent has fully evaporated. After that, the film is separated from the carrier surface by peeling. Cutting blades or dies are used to cut it into the appropriate sizes and forms, usually square or rectangular. Packing: To prevent

deterioration and moisture absorption, the individual film units are packaged into pouches, blister packs, or sachets [2][10][25].

Test of Quality Control for Quick-Dissolving Film:

Study of Morphology:

Morphological assessment of oral films is often performed using scanning electron microscopy (SEM) at specified magnifications. This method indicates precise surface properties, and can be utilized to compare the top and bottom sides of the strip. SEM analysis also helps compare the uniformity of the film (i.e. uneven patches) and the distribution of the (API) through the matrix. [26].

Weight Variations:

Ten randomly chosen videos are individually weighted to evaluate weight variance. There should not be a significant deviation from the average weight [27].

Thickness:

Fast dissolving films are generally measured for thickness with a micrometre screw gauge. The thickness is measured at five different positions (one at the centre, one at each of the four corners) to determine an average value to evaluate film uniformity. Five films are chosen at random to test for thickness uniformity, and each formulation's thickness is measured. The films' maximum thickness variation should be less than 5% and means. Dis computed [28].

Surface pH:

The oral strip's surface pH is calculated to assess the likelihood of any negative in vivo effects It is important to maintain the surface pH of fast-dissolving films close to neutral, as extreme acidic or alkaline conditions could irritate the oral mucosa. This is assessed by using a combination pH electrode to precisely measure the surface pH of the film. [10][29].

Track Tests And Dryness Tests:

Eight different classifications of dried film exist: set-to-touch, dust-free, track-free, dry-totouch, dry-hard, dry through, dry-to-recoat, and dry print-free. The ability to assess this feature is assured by how tenaciously certain accessories that contact the strip are held by the film in question.[1][30].

Tensile Strength:

To determine a film´s tensile strength, subject the film to the maximum possible force at a point until the oral film ruptures. Tensile strength is calculated, according to the following formula, by dividing the area of the cross-section of the oral film by the applied load at rupture.[3][31].

Folding Endurance:

Folding endurance is established through repeated folding of a film in the same place until the film breaks. The folding endurance is indicated as the number of times the film can be folded without breaking. Folding endurance represents some combination of mechanical strength and flexibility. [1][33].

Transparency:

Oral films transparency can be measured by UV–visible spectrophotometer for transmittance using rectangular samples of the film. The rectangular sample, after being cut, is placed on the spectrophotometer cell at the inner surface to measure the transmittance at 600 nm. The degree of
transparency is still a function of transmittance whereby greater transmittance indicates a more transparent film. [1][34][35].

Disintegration Time:

According to CDER guidelines, oral disintegrating tablets must dissolve in 30 seconds or less. This time limit also applies to fast-dissolving oral films. There are currently no recognized guidelines for oral fast-dissolving films. For this investigation, pharmacopoeia disintegration test equipment may be used. Film often dissolves after 5–30 seconds [36-38].

Test for In-Vitro Dissolution:

In-vitro dissolution testing of fast dissolving films is usually done using either the paddle or basket apparatus set forth in pharmacopeial methods. The selection of dissolution medium and volume will depend on drug dose and the level of sink conditions to properly assess the drug release. The paddle-type apparatus is the most widely used for oral strips as the tendency of the strip to float on the surface of the dissolution medium may affect the testing in other apparatuses. [39- 40][41].

Stability Testing:

In accordance with the ICH recommendation, oral strips 12 are stored in stability chambers for a duration of 12 months at controlled temperatures of 25ºC/60%RH and 40°C/75%. This allows for the determination of stability [42-43]. Several evaluation parameters, such as water content, tensile strength, thickness, morphological characteristics, and dissolving behavior, are examined over the course of storage [44-46]. Johns Hopkins University in the United States developed the rotavirus vaccine in 2006. Getting vaccinated will be as simple as cleaning your 13 breath thanks to the rotavirus vaccine, which is oral thin

film vaccine that dissolves fast and is stable at room temperature. Compared to existing items, this distribution strategy offers a number of advantages. The big pharmaceutical company Pfizer created the first of these oral strips, which they called Listerine® pocket packs and used to refresh the mouth [2][6]. According to technology catalysts, sales of fast-dissolving products have increased significantly from $850 million in 2007 to $2 billion soon [1] [45-47].

CONCLUSION

"Fast dissolving films" (FDFs) are thin films for oral delivery that disperse in mouth without water. FDFs offer faster absorption and onset of action of a drug. FDFs can offer an advantage for patient compliance especially in the young child, elderly, and in patients that have trouble swallowing. FDFs are also useful in urgent situations where therapy must be initiated quickly, such as in cases of allergy, asthma, and brief contractions or spasms. FDFs provide faster medication delivery with effective pharmacophores via by passing GI track & first pass metabolism.

REFERENCES

1. Siddiqui Nehal, M.D., G. Garg and P.A. Sharma, (2011): Short review on A novel approach in oral fast dissolving drug delivery system and their patents. Advances in Biological Research, pp: 291-303.
2. Dixit, R.P. and S.P. Puthli, (2009). Oral strip technology: Overview and future potential, Journal of Controlled Release., 139: 94-107.
3. Vollmer, U. and P. Galetti, (2006). Rapid Film: Oral Thin Films as an Innovative Drug Delivery System and Dosage Form. Drug Development Report, pp: 1-5.
4. Mahajan, A., N. Chhabra and G. Agarwal, 2011. Formulation and Characterization of Fast Dissolving Buccal film: A Review; Der Pharmacia Sinica., 3(1): 152-165.
5. Suresh, B., D. Halloran and L. James, (2006). Quick Dissolving Films: A Novel Approach to Drug Delivery. Drug Development Technology., pp: 1- 7.
6. Gavaskar, B., S.V. Kumar, G. Sharan and Y. Madhusudan, (2010). Overview on Fast Dissolving Films. International Journal of Pharmacy and Pharmaceutical Sciences, 3(2): 29-33
7. Cilurzo, F., P. Paola Meneghetti, A. Como and L. Montanari, (2010). MaltodextrinFasmaltodextrin Fast Dissolving Film: A Feasibility Study. AAPS Journal, 11:4.
8. Singh, P., K. Chuanli, M. Verma, Yasir Mohd, A. Khan, Sharma and N. Gupta, (2011). Orally disintegrating tablets formulation, preparation techniques and evaluation Nagar Journal of Applied Pharmaceutical Science, 1(4): 35-45
9. Dheere, P.M. and S.L. Patwekar, (2011). Review on preparation and evaluation of oral disintegrating films IJPT, 3(4): 1572-1585.
10. Gauri, S. and G. Kumar, (2012). Fast dissolving drug delivery and its technologies, The pharma Innovation, 1(2): 34-39.
11. Aggarwal, J. and G. Singh, (2011). Fast Dissolving Film: A Noval Approach to oral drug delivery. International Research Journal of Pharmacy, 2:69- 74.
12. Kalyan, S. and M. Bansal, (2012). Recent Trends in the Development of Oral dissolving Film, International Journal of Pharm Tech Research, 4(2): 725- 733.
13. Coppens, K.A., M.J. Hall, S.A. Mitchell and M.D. Read, (2005). Hypromellose, Ethyl Cellulose and Polyethylene oxide used in Hot Melt Extrusion. Pharmaceutical Technology, pp: 1-5.
14. Arunachalam, A., M. Karthikeyan, S. Ashutosh Kumar and K. Kishore, (2010). Fast dissolving drug delivery system: a review, Journal of Global Trends in Pharmaceutical Sciences, 1(1): 92-110.
15. Nagar, P. and Y. Chauhaniti, (2011). Asir Mohd, Insights into Polymers: Film Formers in Mouth Dissolving Films, Drug Invention Today, 3(12): 280-289.
16. Frey, (2006). Film strips and pharmaceuticals. Pharmaceutical Manufacturing and Packaging Resource, 4: 92-93.
17. Saurabh, R., R. Malviya and P.K. Sarma, (2011). Trend in Buccal Film: Formulation Characteristics, Recent Studies and Patents. European Journal of Applied Sciences, 3(3): 93-101.
18. Vondrak, B., (2008). Barnhart, Scott. Dissolvable Films: A Novel Approach to Drug Delivery. Drug Development Technology, pp: 1-5.
19. Suresh, B.B., H. David and L.O. James, (2003). Quick Dissolving film: A Novel Approach to Drug. Oral Film Technology, 2(3): 1-6.
20. Chien, M.J., G. Tirol, C. Chien and R. Schmitt, (2006). Film Forming Polymers in Oral Films. Poster Presented at the 2006 Annual Meeting and Exposition of the American Association of Pharmaceutical Scientist, AAPS, pp: 1-5.
21. Cilurzo, F., P. Meneghetti, A. Como and L. Montanari, (2005). Feasibility Study of Fast Dissolving Containing Piroxicam. AAPS Journal, pp: 50-54.
22. Fuzee SV, P.M. Satturwar and A.K. Dorle, (2002). Polymerised rosin: Novel Film Forming Polymer for Drug Delivery. International Journal of Pharmacy, 249: 175-184.
23. Wale, A. and P.J. Weller, 1994. Handbook of pharmaceutical Excipient. 2nd edition.; 24, 27, 352, 448.
24. Chapdelaine, A.H., D.J. Zyck and M.R. Dzija, (2004). Edible Film Formulations Containing Maltodextrin. US Patent. Mav25. US Patent. 6740332.
25. Patel, A.R., D.S. Prajapati and J.A. Raval, (2010). Fast dissolving films (fdfs) as a newer venture in fast dissolving

dosage forms. International Journal of Drug Development & Research., 2(2): 233-246.
26. Koland, M., V. Sandeep and N. Chary ulu, (2010). Fast Dissolving Sublingual Films of Ondansetron hydrochloride: Effect of Additives on invitro Drug Release and Mucosal Permeation. Journal of Young Pharmacist, 2(3): 216-222.
27. Mahesh, A., N. Shastri and M. Sadanandam, (2010). Development of Tastes Masked Fast Disintegrating Films of Levocetirizine Dihydrochloride for Oral Use. Current Drug Delivery, 1(7): 21-27.
28. Kulkarni, A.S., H.A. Deokule, M.S. Mane and D.M. Ghadge, (2010). Exploration of Different Polymers for Use in the Formulation of Oral Fast Dissolving Strips. Journal of Current Pharmaceutical Research, 2(1): 33- 35.
29. Kunte, S. and P. Tan dale, (2010). Fast Dissolving Strips: A Novel Approach for the Delivery of Verapamil. Journal of Pharmacy and Bio allied Sciences, 2(4): 325-328.
30. Shimoda, H., K. Taniguchi and M. Nishimura, (2009). Preparation of a FastDissolving Oral Thin Film Containing Dexamethasone: A Possible Application to Antiemesis during Cancer Chemotherapy. European Journal of Pharmaceutics and Biopharmaceutics, 73: 361-365.
31. Patel, R., N. Shardul, J. Patel and A. Baria, (2009). Formulation Development and Evaluation of Mouth Melting film of Ondansetron. Archives of Pharmacal Science & Research, 1: 213-217.
32. Nishimura, M., (2009). In-vitro and In-vivo characteristics of Prochlorperazine disintegrating film. International Journal of Pharmaceutical Technology, 368:98-102. 33.
33. Sumitha, C.H., S.N. Karuna, B. Divya, K. Madhavi, V. Kumar, M. Varma and N.N. Char be (2009). Taste Masking of Ondansetron Hydrochloride by Polymer Carrier System and Formulation of Rapid -Disintegrating Films. International Journal of Chemistry Research, 68: 90-102.
34. Francesco, C., I.E. Capone, P. Minghetti, S. Buratti, F. Selmin and G.M. Chiara, (2008). Nicotine Fast Dissolving Films Made of Maltodextrins: A Feasibility Study; European Journal of Pharmaceutics and Biopharmaceutics, 70(3): 895-900.
35. Murata, Y., T. Isobe, K. Kofuji, N. Nishida and R. Kamagu chi, (2010). Preparation of Fast Dissolving Films for Oral Dosage from Natural Polysaccharides Materials, 3:
36. 4291-4299.
37. Shelke, P.V., A.S. Dumbare, M.V. Gadhave, S.L. Jadhav, A.A. Sonawane and D.D. Gaikwad, (2012). Formulation and evaluation of rapidly disintegrating film of amlodipine besylate. JDDT, 2(2): 72-75.
38. Brenda Nevidjon, R.N. and F.A.A.N. MSN, (2010). Rekha Chaudhary. MD Controlling Emesis: Evolving Challenges. Novel Strategies, 8(2): 1-10.
39. Mahajan A. Formulation and Evaluation, (2012).Fast dissolving Buccal films of Sertraline. International Journal of Drug Development & Research, 4(1): 220-226.
40. Choudhary, R.D., V.A. Patel, U.K. Chhalotiya, V.H. Patel and J.A. Kunda Wala, (2012). Natural polysaccharides as film former: a feasibility study for development of rapid dissolving films of ondansetron hydrochloride. Int J. Pharm Pharm Sci., 4(3): 78-85.
41. Javier, O. Morales and T. Jason McConville, (2011). Manufacture and characterization of mucoadhesive buccal films European Journal of Pharmaceutics and Biopharmaceutics., 77: 187-199.
42. Aksungura, P., A. Sungurb, US. Nalc, A.B. I'skitd, A.C. Squiere and S. Senela, (2004). Chitosan delivery systems for the treatment of oral mucositis: in vitro and in vivo studies. Journal of Controlled Release., 98: 269-279.
43. Watanabe, S., K. Suemaru, T. Yamaguchi, N. Hidaka and S.M. Akanaka, (2009).Hiroaki Araki Effect of oral mucosal adhesive films containing ginsenoside Rb1 on 5-fluorouracil-induced oral mucositis in hamsters. European Journal of Pharmacology, 616: 281-286.
44. Parmar, D., U. Dr. Patel, Bbhimani, A. Tripathi, D. Daslaniya and G. Patel, (2012). Orally fast dissolving films as dominant dosage Form for quick release. International Journal of Pharmaceutical Research and Bio-science, 1(3): 27-41.
45. Mital S. Panchal, H. Patel, A. Bagada and K.R. Vadalia, (2012). Formulation and Evaluation of Mouth Dissolving Film Hydrochloride of by Using Ropinirole Pullulan Polymers. International Journal of Pharmaceutical Research and Allied Sciences,1(3): 60-72.
46. Malke M.S. Shidhaye and V.J. Kadam., (2007). Formulation and Evaluation of Oxacarbazine Fast Dissolve Tablet. Indian Journal of Pharmaceutical Science, pp: 64-67.
47. Arya, A., A. Chandra, V. Sharma and K. Pathak, (2010). Fast Dissolving Oral Films: An Innovative Drug Delivery System and Dosage Form. International Journal of Chem Tech Research, 2(1): 576-583.
48. Tiwari, G., A. Pathak, R. Goyal, C.S. Jadaun, R. Shivhare and K. Sharma, (2012). Fast dissolving tablets: a novel approach to drug. Delivery World Journal of Pharmaceutical Research, 1(3): 478-499.