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Recent Advances in Taste Masking Technologies for Bitter Drugs: Applications in Orodispersible Tablets

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Abstract

Taste is an important factor affecting the acceptability and compliance of orally administered medicines. Bitter and unpleasant drug substances can be particularly problematic in pediatric, geriatric, and dysphagic patients. Orodispersible tablets (ODTs) are widely used because of their rapid disintegration in the oral cavity, ease of administration, and improved patient convenience; however, direct contact of the drug with taste buds can result in unpleasant taste. Therefore, effective taste masking is essential for the successful development of palatable ODT formulations. Various conventional and advanced approaches, including the use of sweeteners and flavors, polymer coating, microencapsulation, cyclodextrin complexation, ion-exchange resins, solid dispersion, lipid-based systems, and novel drug-delivery technologies, have been investigated for taste masking. The present review discusses the mechanisms of taste perception, major taste-masking technologies, their applications in orodispersible tablets, and commonly used evaluation methods such as sensory evaluation, dissolution testing, and electronic tongue analysis. The advantages and limitations of different approaches are also highlighted. Overall, appropriate selection and optimization of taste-masking technology can improve palatability, patient acceptability, medication adherence, and the therapeutic performance of orodispersible drug-delivery systems.

Keyword: Taste masking, Bitter drugs, Orodispersible tablets, Palatability, Taste perception, Microencapsulation, Ion-exchange resins, Cyclodextrins, Patient compliance, Taste evaluation

Introduction

Taste and texture are important characteristics of oral dosage forms that can significantly influence patient acceptability, medication compliance, and therapeutic outcomes. When a drug dosage form dissolves or disperses in saliva, the drug substance may interact with taste receptors located on the tongue, producing sensations such as bitterness, sweetness, sourness, or other taste perceptions^[1]. Among these, bitterness is one of the most common and undesirable characteristics associated with several active pharmaceutical ingredients.

The unpleasant taste of a drug can reduce patient acceptance and may lead to poor medication adherence, particularly in pediatric and geriatric patients. Therefore, effective taste masking is an important formulation consideration in the development of patient-friendly oral dosage forms^[2]. Although numerous approaches have been developed to reduce or eliminate the unpleasant taste of pharmaceutical ingredients, no single taste-masking technology is universally applicable to all drugs because of differences in drug properties, dose, solubility, and formulation characteristics^[3].

Taste masking becomes particularly important for rapidly disintegrating dosage forms, such as orodispersible tablets (ODTs), because the drug can come into direct contact with the taste receptors in the oral cavity before swallowing. Various formulation strategies have therefore been investigated to improve palatability while maintaining desirable drug-release characteristics and therapeutic performance. These approaches include the use of sweeteners and flavors, polymer coating,

microencapsulation, complexation, ion-exchange resins, and other advanced drug-delivery technologies [4].

The present review focuses on the major principles, technologies, and evaluation methods used for taste masking of bitter drugs, with particular emphasis on their application in orodispersible tablets. Understanding these approaches can facilitate the development of palatable, patient-friendly oral formulations with improved acceptability and compliance.

Table 1: Advantages of Taste Masking and Orodispersible Drug Delivery Systems [5, 6, 7]

Sr. No.	Advantage	Description
1	Improved pediatric acceptability	Taste masking reduces bitterness and unpleasant taste, improving acceptance among pediatric patients.
2	Improved geriatric acceptability	Facilitates medication administration in elderly patients, particularly those experiencing swallowing difficulties.
3	Enhanced patient compliance	Improved palatability and ease of administration can encourage regular medication use.
4	Reduced unpleasant aftertaste	Taste-masking technologies minimize bitterness and other undesirable taste sensations.
5	Improved palatability	Sweeteners, flavors, polymer coating, microencapsulation, and other approaches improve the sensory properties of formulations.
6	Rapid disintegration	Orodispersible tablets rapidly disintegrate or disperse in the oral cavity.
7	No water required	ODTs can generally be administered without water, providing greater convenience.
8	Ease of administration	Particularly useful for pediatric, geriatric, dysphagic, and other patients who have difficulty swallowing conventional tablets.
9	No chewing required	The dosage form is designed to disintegrate rapidly in the mouth without conventional chewing.
10	Rapid drug release	Rapid disintegration can facilitate dissolution and drug release, depending on the formulation.
11	Potential for improved drug absorption	Rapid dissolution may facilitate drug absorption and, for suitable drugs, may contribute to pregastric absorption.
12	Convenient and portable dosage form	ODTs are easy to carry and administer, making them suitable for use in various situations.
13	Liquid-like administration with solid-dose convenience	Combines the handling and stability advantages of a solid dosage form with rapid dispersion in the oral cavity.
14	Product differentiation	Effective taste masking and patient-friendly characteristics can provide opportunities for product differentiation.
15	Manufacturing flexibility	ODTs can be prepared using several techniques, including direct compression, molding, and lyophilization.

Methods and Methodology

Taste Masking Technologies

Various approaches have been developed to reduce or eliminate the unpleasant taste of bitter drugs. The selection

of a suitable technique depends on the physicochemical properties of the drug, dose, solubility, required drug-release profile, and intended dosage form. The major taste-masking technologies are described below.



Fig 1: Taste Masking Technologies

Taste Masking with Flavors and Sweeteners

The use of flavors and sweeteners is one of the simplest and most commonly used approaches for improving the palatability of pharmaceutical formulations. Natural or artificial sweeteners, flavors, and flavor-modifying agents can reduce the perception of bitterness and provide a more acceptable sensory profile. Sweeteners such as sucrose, sorbitol, mannitol, aspartame, sucralose, and saccharin are frequently incorporated into oral formulations. Certain flavor-modifying agents, such as neohesperidin dihydrochalcone, can also reduce the perception of bitterness and enhance overall palatability [8].

Taste Masking by Microencapsulation

Microencapsulation is an effective technique in which drug particles are surrounded by a polymeric coating or incorporated into a protective matrix. The coating reduces direct contact between the drug and taste receptors in the oral cavity while allowing appropriate drug release after administration. Polymers such as ethyl cellulose and other film-forming materials can be used for microencapsulation. Plasticizers may be incorporated to improve the flexibility and mechanical properties of the coating. Microencapsulation is particularly useful for bitter drugs intended for rapidly disintegrating oral dosage forms [9].

Taste Masking by Ion-Exchange Resins

Ion-exchange resins (IERS) are widely investigated for taste masking of ionizable bitter drugs. The drug interacts with oppositely charged functional groups of the resin to form a drug-resin complex. This complex reduces the availability of free drug in saliva and consequently decreases interaction with taste receptors. Drug release occurs subsequently under appropriate physiological conditions. Ion-exchange resins can also be incorporated into formulations designed for modified or controlled drug release [10].

Taste Masking by Inclusion Complex Formation

Inclusion complexation is an important approach for reducing the unpleasant taste of bitter drugs. In this technique, the drug molecule acts as a guest and is incorporated into the cavity of a suitable host molecule. Cyclodextrins are among the most widely used complexing agents because they possess a hydrophilic outer surface and a relatively hydrophobic internal cavity. Complex formation can reduce the amount of free drug available for interaction with taste receptors and may also improve the aqueous solubility and stability of certain drugs [11].

Taste Masking by Granulation

Granulation can be used to incorporate bitter drug particles into a protective matrix, thereby reducing direct exposure of the drug to taste receptors. Melt granulation is particularly useful when suitable thermoplastic binders or lipid-based materials are employed. Materials such as glyceryl monostearate, glyceryl distearate, glyceryl dibehenate, hydroxypropyl cellulose, and selected pharmaceutical polymers may be used depending on the formulation requirements. The granulation process can provide a physical barrier around the drug and modify its release characteristics [12].

Taste Masking by Adsorption

Adsorption involves the attachment of drug molecules onto the surface of suitable adsorbent materials. The adsorbed drug may exhibit reduced availability in saliva, thereby

decreasing interaction with taste receptors. Common adsorbent materials include colloidal silicon dioxide, bentonite, veegum, and other silicate-based materials. The resulting adsorbate can subsequently be incorporated into tablets, capsules, or other oral dosage forms. Adsorption has been investigated for taste masking of several bitter pharmaceutical ingredients [13].

Taste Masking by Prodrug Approach

The prodrug approach involves chemical modification of the parent drug to produce a derivative with reduced interaction with taste receptors. The modified compound is subsequently converted into the active drug after administration through chemical or enzymatic processes, depending on the design. By altering the physicochemical characteristics of the drug molecule, interaction with bitter taste receptors can be reduced. Although this approach can provide effective taste masking, it requires appropriate consideration of chemical stability, conversion to the active drug, safety, and pharmacokinetic properties [14].

Taste Masking by Solid Dispersion

Solid dispersion involves dispersing a drug within a suitable hydrophilic or polymeric carrier. Taste masking can occur through molecular dispersion, entrapment, or interaction of the drug with the polymeric carrier, resulting in reduced exposure of the drug to taste receptors. Polymers such as Eudragit® E100 have been investigated for taste masking because they can reduce drug release in the oral environment while permitting release under suitable gastrointestinal conditions. Solid-dispersion systems may be evaluated for compatibility, drug content, dissolution, disintegration, and taste-masking efficiency [15].

Taste Masking by Gelation

Gelation-based taste masking involves the formation of a protective gel layer around the dosage form or drug particles. Polymers such as sodium alginate can form gels in the presence of suitable multivalent ions, such as calcium ions. The resulting gel layer acts as a barrier between the drug and taste receptors and can reduce the perception of bitterness during administration. The thickness and mechanical properties of the gel layer must be optimized to achieve effective taste masking without adversely affecting drug release [16].

Taste Masking by Rheology Modifiers

Rheology modifiers increase the viscosity of liquid formulations and can reduce the diffusion of dissolved drug molecules toward taste receptors. Thickening agents such as sodium carboxymethyl cellulose, hydroxypropyl cellulose, xanthan gum, and polyethylene glycol, depending on formulation requirements, can be used to modify viscosity. Increased viscosity may reduce the rate at which bitter drug molecules interact with taste receptors and can therefore improve the palatability of liquid oral formulations [17].

Taste Masking by Effervescent Agents

Effervescent systems can contribute to taste masking through rapid generation of carbon dioxide following contact with saliva or an aqueous medium. The resulting effervescence can alter the sensory perception of the formulation and facilitate rapid dispersion of the dosage form. Effervescent agents such as combinations of citric acid or tartaric acid with sodium bicarbonate have been incorporated into certain oral formulations. In addition to improving palatability,

effervescence may facilitate rapid drug release and enhance the convenience of administration ^[18].

Orodispersible Tablets

Orodispersible tablets (ODTs) containing taste-masked drug complexes can be prepared using the direct-compression method. The required quantities of the drug or drug- β -cyclodextrin complex and selected excipients are accurately weighed and thoroughly mixed using a mortar and pestle. The required quantity of lubricant is then added and mixed uniformly to ensure adequate flow and compression properties ^[19]. The formulation may contain the active pharmaceutical ingredient (API), β -cyclodextrin inclusion complex, aspartame, mannitol, lactose, suitable flavoring

agent, talc, magnesium stearate, microcrystalline cellulose, and varying concentrations of superdisintegrant. The total weight of the tablets is maintained constant for all formulation batches. The prepared powder blend is compressed into tablets using suitable flat-faced punches on a single-punch or rotary tablet compression machine. In one approach, an eight-station rotary tablet machine may be employed for direct compression of the formulation blend ^[20]. The prepared ODTs are subsequently evaluated for physical and pharmaceutical characteristics, including weight variation, thickness, hardness, friability, wetting time, disintegration time, drug content, *in-vitro* dissolution, and taste-masking efficiency.

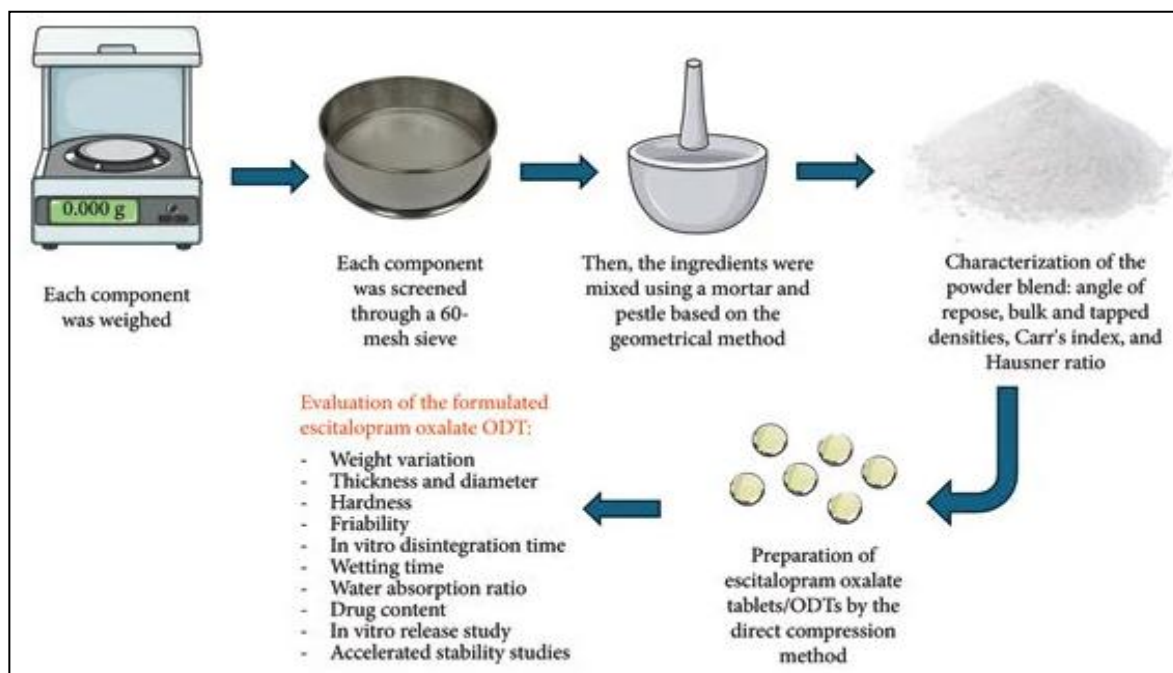


Fig 2: Orodispersible Tablets

Evaluation Techniques

Table 2: Evaluation Techniques Used for Taste-Masked Formulations

Evaluation Method	Brief Description
1. Panel Testing	A trained panel evaluates the bitterness and overall palatability of the formulation using a predefined numerical scale, commonly 0–5 ^[21] .
2. Frog Taste-Nerve Response	Taste responses are evaluated by measuring changes in electrical activity of frog taste cells following exposure to taste-producing substances ^[22] .
3. Multichannel Taste Sensor (Electronic Tongue)	An electronic taste sensor uses lipid/polymer membranes to detect and quantify taste responses. It provides an objective assessment of bitterness and other taste characteristics ^[23,24] .
4. FT-IR Analysis	Fourier-transform infrared spectroscopy is used to assess drug–excipient compatibility and identify possible chemical interactions in the formulation ^[25] .
5. Differential Scanning Calorimetry (DSC)	DSC is used to investigate thermal behavior, physical state, and possible interactions between the drug and excipients ^[26] .
6. X-Ray Diffraction (XRD)	XRD is used to characterize the crystalline or amorphous nature of the drug, drug–excipient complex, or formulation ^[27] .

Table 3: Evaluation Parameters for Orodispersible Tablets

Evaluation Parameter	Brief Description
1. Wetting Time	Measures the time required for water to completely wet the tablet. A shorter wetting time generally indicates faster water penetration ^[28] .
2. <i>In-vitro</i> Disintegration Time	Determines the time required for the tablet to disintegrate in a suitable medium using a USP disintegration apparatus ^[29] .
3. <i>In-vitro</i> Dissolution Study	Determines the rate and extent of drug release from the formulation using a USP dissolution apparatus under specified conditions ^[30] .

Table 4: Some Examples of Taste-Masked Drug Compounds [31–40]

Sr. No.	Name of Drug	Method of Taste Masking	Category of Drug
1	Epinephrine	Flavors and Sweeteners	α - β Adrenergic Agonist
2	Levofloxacin	Microencapsulation	Antibiotic
3	Chloroquine	Ion-Exchange Resins	Antimalarial
4	Lornoxicam	Inclusion Complex Formation	NSAID
5	Pirenzepine	Granulation	Antispasmodic
6	Loperamide	Adsorption	Antidiarrheal
7	Chloramphenicol	Prodrug Approach	Antibiotic
8	Promethazine	Solid Dispersion	Antihistamine
9	Chlorpheniramine	Gelation	Antihistamine
10	Fentanyl	Effervescent Agent	Opioid Analgesic
11	Ibuprofen	Microencapsulation	NSAID / Analgesic
12	Paracetamol	Ion-Exchange Resin / Complexation	Analgesic / Antipyretic
13	Azithromycin	Polymer Coating	Macrolide Antibiotic
14	Cefixime	Ion-Exchange Resin	Cephalosporin Antibiotic
15	Metronidazole	Inclusion Complexation	Antiprotozoal / Antibiotic
16	Ondansetron	Ion-Exchange Resin / Complexation	Antiemetic
17	Ranitidine	Ion-Exchange Resin	H ₂ -Receptor Antagonist
18	Diclofenac Sodium	Microencapsulation / Polymer Coating	NSAID
19	Dextromethorphan	Ion-Exchange Resin	Antitussive
20	Cetirizine	Cyclodextrin Complexation	Antihistamine

Recent Advances in Taste Masking Technologies for Bitter Drugs [40–47]

Recent developments in taste masking have shifted from conventional approaches such as sweeteners and flavors toward more precise, polymer-based, biomaterial-based, and digitally assisted technologies. Current research focuses on achieving effective bitterness reduction without adversely affecting rapid disintegration, dissolution, bioavailability, and overall performance of orodispersible tablets (ODTs).

Hot-Melt Extrusion

Hot-melt extrusion (HME) has emerged as an important solvent-free technique for taste masking. In this approach, the bitter active pharmaceutical ingredient is dispersed within a suitable polymeric matrix, forming a physical barrier that reduces drug exposure to taste receptors. HME can provide continuous processing and is particularly attractive for developing taste-masked solid dosage forms.

Advanced Polymer and Biomaterial-Based Encapsulation

Modern taste-masking systems increasingly use polymeric coatings, lipid-based materials, and biomaterials to physically separate bitter drug particles from the taste receptors. Encapsulation and complexation approaches can reduce drug release in saliva while allowing appropriate release after swallowing.

3D-Printed Orodispersible Tablets

Three-dimensional printing is being investigated for the development of personalized ODTs with controlled drug loading, geometry, porosity, and disintegration characteristics. Taste-masking materials can potentially be incorporated into printed structures, allowing formulation properties to be tailored to individual patient requirements. Recent reviews identify personalized 3D printing as an emerging direction in ODT development.

Electronic Tongue-Based Taste Evaluation

Electronic tongue systems have become increasingly important for objective evaluation of pharmaceutical bitterness. These systems use sensor arrays to generate measurable responses corresponding to different taste characteristics and can support formulation screening and comparison of taste-masking efficiency. Recent research

emphasizes the need for qualified and standardized protocols for reliable pharmaceutical applications.

Biosensors and Advanced Bitterness Assessment

Biosensor-based approaches represent an emerging alternative to conventional sensory evaluation. Recent research has focused on chemical, biological, electronic, and biomimetic approaches for quantitatively assessing unpleasant tastes. These methods may improve the reproducibility and sensitivity of taste evaluation during formulation development.

Nanotechnology-Based Taste Masking

Nanotechnology-based delivery systems are being explored for reducing direct interaction between bitter drug molecules and taste receptors. Nanoencapsulation and related carrier systems can provide a protective barrier and may simultaneously offer opportunities for improving drug solubility, stability, and controlled release. Nanotechnology has been identified as a promising future direction for more precise taste masking.

Artificial Intelligence and Machine Learning

Artificial intelligence (AI) and machine learning are emerging as data-driven tools for pharmaceutical taste masking. Recent work proposes the use of AI for taste prediction, excipient selection, formulation optimization, and interpretation of taste-sensor data. These approaches may reduce empirical trial-and-error during formulation development and support more personalized taste-masking strategies.

Personalized and Patient-Centric Taste Masking

The current trend is moving toward patient-centric formulations in which taste, dose, disintegration time, drug release, and patient characteristics are considered simultaneously. This approach is particularly relevant to pediatric and geriatric populations, where acceptability and ease of administration are important formulation considerations.

Integration of Taste Masking with Rapid Drug Release

A major formulation challenge is achieving both effective taste masking and rapid drug release. Excessive coating or strong drug-polymer interactions may reduce bitterness but

can delay dissolution. Therefore, recent approaches aim to create selective barriers that remain effective in the oral cavity but permit rapid drug release after swallowing.

Future Perspective

The future of taste masking is likely to involve the integration of advanced encapsulation, hot-melt extrusion, nanotechnology, electronic tongues, biosensors, AI-based prediction, and personalized manufacturing. Such technologies could facilitate more systematic selection of taste-masking materials and improve the development of patient-friendly ODTs with optimized palatability, rapid disintegration, and appropriate drug-release characteristics.

Conclusion

Taste masking is an important formulation strategy for improving the palatability, acceptability, and patient compliance of bitter pharmaceutical preparations, particularly in orodispersible tablets (ODTs). Conventional approaches such as sweeteners, flavors, polymer coating, microencapsulation, cyclodextrin complexation, ion-exchange resins, adsorption, and solid dispersion remain useful, while advanced technologies such as hot-melt extrusion, nanotechnology, 3D printing, electronic tongues, biosensors, and artificial intelligence are expanding the possibilities for more effective and quantitative taste masking. The selection of an appropriate technology depends on drug characteristics, dose, solubility, stability, desired drug-release profile, and patient requirements. Importantly, taste masking should be optimized without compromising rapid disintegration and dissolution, which are essential characteristics of ODTs. Recent developments in AI-assisted formulation design and patient-centric drug delivery may further support the development of personalized and highly palatable ODTs. Overall, integration of innovative taste-masking technologies with robust evaluation methods can contribute to the development of effective, acceptable, and patient-friendly oral drug-delivery systems.

References

- Sharma V, Chopra H. Role of taste and taste masking of bitter drugs in pharmaceutical industries: an overview. *Int J Pharm Sci*. 2010;2(4):123–150.
- Pagar HB, Shinde UP, Agrawal YS, Barhate SD, Luhade TS, Sonawane RO. Taste masking: A review. *Res J Pharm Technol*. 2012;5(2):152–170.
- Thoke S. Taste masking approaches and evaluation of taste masking. *Int J Pharm Sci*. 2012;3:1895–1907.
- Roy S, Upadhyay R, Vyas J, Upadhyay U. Taste masking of oral pharmaceuticals. *J Pharm Pharm Sci*. 2023;12(2):1–9.
- Fating HK, Ambadkar JV, Kajale AD. Advances in taste masking of drug: a review study. *J Drug Deliv Ther*. 2022;12(3-S):262–270.
- Bhusnure O, Shaikh F, Sugave B, Kavale B, Sayyed R, Hucche B. Formulation strategies for taste-masking of chewable tablets. *Am J Pharm Res*. 2015;5:3836–3849.
- Ghosh T, Ghosh A, Prasad D. A review on new generation orodispersible tablets and its future prospective. *Int J Pharm Pharm Sci*. 2011;3(1):1–7.
- Abraham J, Mathew F. Taste masking of paediatric formulation: a review on technologies, recent trends and regulatory aspects. *Int J Pharm Sci*. 2014;6(1):12–19.
- Al-Omran MF, Al-Suwayeh SA, El-Helw AM, Saleh SI. Taste masking of diclofenac sodium using microencapsulation. *J Microencapsul*. 2002;19(1):45–52.
- Suhagiya VK, Goyani AN, Gupta RN. Taste masking by ion exchange resin and its new applications: a review. *Int J Pharm Sci Res*. 2010;1(4):22–37.
- Ouhaddouch H, Fahry A, Cherkaoui N, Elalaoui Y. Taste masking: most common techniques used in pharmaceutical industry. *Eur J Pharm Med Res*. 2020;7(4):81–88.
- Forster SP, Lebo DB. Continuous melt granulation for taste-masking of ibuprofen. *Pharmaceutics*. 2021;13(6):863.
- Chauhan R. Taste masking: a unique approach for bitter drugs. *J Stem Cell Biol Transplant*. 2017;1(2):12–20.
- Karaman R. Prodrugs for masking the bitter taste of drugs. In: *Application of Nanotechnology in Drug Delivery*. 2014. p. 399–445.
- Shah PP, Mashru RC. Development and evaluation of artemether taste masked rapid disintegrating tablets with improved dissolution using solid dispersion technique. *AAPS PharmSciTech*. 2008;9:494–500.
- Kaneko K, Kanada K, Yamada T, Miyagi M, Saito N, Ozeki T, *et al*. Application of gel formation for taste masking. *Chem Pharm Bull*. 1997;45(6):1063–1068.
- Minde D, Saudagar R. A review on taste masking: a novel approach of new trends for obnoxious drugs. *World J Pharm Res*. 2016;5(9):410–428.
- Sawan MS. Review on taste masking approaches in oral pharmaceutical dosage forms. *Lebda Med J*. 2015;1(1).
- Hassan AH, Haleem AM, El-Nabarawy MA, Abd-Elbary A. Formulation and evaluation of taste-masked orally disintegrating tablets of nicergoline based on β -cyclodextrin inclusion complexation. *Int J Drug Deliv*. 2013;5(1):110–116.
- Dungarwal UN, Patil SB. Development of orodispersible tablets of taste masked rizatriptan benzoate using hydroxypropyl β -cyclodextrin. *J Pharm Investig*. 2016;46(6):537–545.
- Tripathi A, Parmar D, Patel U, Patel G, Daslaniya D, Bhimani B. Taste masking: a novel approach for bitter and obnoxious drugs. *J Pharm Sci Biosci Res*. 2011;1(3):36–142.
- Akaike N, Noma A, Sato M. Electrical responses of frog taste cells to chemical stimuli. *J Physiol*. 1976;254(1):87–107.
- Kalaskar R, Singh RP. Taste masking: a novel technique for oral drug delivery system. *Asian J Pharm Res Dev*. 2014;2:1–4.
- Nayak BS, Sharma DK, Ellaiah P, Sahoo S. *Indian J Novel Drug Deliv*. 2012;4(3):202–209.
- Kolhe S, Ghadge T, Dhole SN. Formulation and evaluation of taste masked fast disintegrating tablet of promethazine hydrochloride. *IOSR J Pharm*. 2013;3(11):1–5.
- Maniruzzaman M, Bonnefille M, Aranyos A, Snowden MJ, Douroumis D. An *in-vivo* and *in-vitro* taste masking evaluation of bitter melt-extruded drugs. *J Pharm Pharmacol*. 2014;66(2):323–337.
- Kumar A, Singh N, Kaushik D. Taste masking of clarithromycin using complexation with ion exchange resin. *Int J Pharm Tech Res*. 2014;6(1):203–211.
- Mahore JG, Wadher KJ, Umekar MJ. Formulation and *in-vitro* evaluation of taste masked orodispersible tablet of metoclopramide hydrochloride. *Int J PharmTech Res*. 2010;2(3):1827–1835.
- Singh J, Bajpai M. Effect of superdisintegrants in the formulation of taste-masked orodispersible tablets of tizanidine HCl. *J Pharm Res*. 2011;4(7):2175–2180.

30. Sharma V, Chopra H. Formulation and evaluation of taste masked mouth dissolving tablets of levocetirizine hydrochloride. *Iran J Pharm Res.* 2012;11(2):457–463.
31. Rachid O, Simons FER, Rawas-Qalaji M, Simons KJ. An electronic tongue: evaluation of the masking efficacy of sweetening and/or flavouring agents on the bitter taste of epinephrine. *AAPS PharmSciTech.* 2010;11:550–557.
32. Yu D. Taste masked pharmaceutical liquid formulations. PCT International Application WO 2001/03698. 2001.
33. Agarwal R, Mittal R, Singh A. Studies of ion-exchange resin complex of chloroquine phosphate. *Drug Dev Ind Pharm.* 2000;26(7):773–776.
34. Sheth S, Patel S, Shukla J. Formulation and evaluation of taste masked oral disintegrating tablet of lornoxicam. *Int J Pharm Biol Sci.* 2010;1:1–9.
35. Ishikawa T, Watanabe Y, Utoguchi N, Matsumoto M. Preparation and evaluation of tablets rapidly disintegrating in saliva containing bitter-taste-masked granules by the compression method. *Chem Pharm Bull.* 1999;47(10):1451–1454.
36. Mackles L, Chavkin L. Tasteless forms of basic drugs prepared by adsorption in situ. *US Patent* 5,811,131. 1998.
37. Taylor EP. Tasteless derivative of chloramphenicol. *J Pharm Pharmacol.* 1953;5:254–256.
38. Sharma G, Pawar VK, Garg G, Awasthi R, Kulkarni GT. Taste masking of promethazine hydrochloride using Eudragit E100 via solid dispersion technique to develop fast disintegrating tablets. *Der Pharm Lett.* 2010;2:83–94.
39. Jelvehgari M, Barghi L, Barghi F. Preparation of chlorpheniramine maleate-loaded alginate/chitosan particulate systems by the ionic gelation method for taste masking. *Jundishapur J Nat Pharm Prod.* 2014;9(1):39.
40. Pather S, Khankari RK, Eichman JD, Robinson JR, Hontz J. Sublingual buccal effervescent. *US Patent* 2002/0110578. 2002
41. Lohare RS, Makka KA, Ghatole S, Roy S, Kardile PK, Kaity S. Strategies for beating the bitter taste of pharmaceutical formulations towards better therapeutic outcomes. *RSC Pharm.* 2025;2:59–81. doi:10.1039/D4PM00191E.
42. Zhang F, Lin L, Wang Z, Li H. Evaluation, correction and masking methods for unpleasant tastes of drugs: A comprehensive review. *Int J Pharm.* 2025;683:126008. doi:10.1016/j.ijpharm.2025.126008.
43. Nayak G, Nayak UY. Hot Melt Extrusion Technology in Taste Masking. *AAPS PharmSciTech.* 2025;26:196. doi:10.1208/s12249-025-03174-9.
44. Qiao C, Hu J, Jin Y, Li R, Zhao F, Zhang Y, *et al.* From empirical exploration to data-driven innovation: The role of artificial intelligence in pharmaceutical taste masking. *Eur J Pharm Biopharm.* 2026;218:114934. doi:10.1016/j.ejpb.2025.114934.
45. Wang P, Li H, Wang Y, Dong F, Li H, Gui X, *et al.* One of the major challenges of masking the bitter taste in medications: an overview of quantitative methods for bitterness. *Front Chem.* 2024;12:1449536. doi:10.3389/fchem.2024.1449536.
46. Zhang F, *et al.* Quantitative evaluation of unpleasant drug tastes using sensory panels, chemical assays, electronic tongues and biosensors. *Int J Pharm.* 2025;683:126008. doi:10.1016/j.ijpharm.2025.126008.
47. Nayak G, Nayak UY. Hot-melt extrusion as a continuous and solvent-free approach for taste masking of bitter active pharmaceutical ingredients. *AAPS PharmSciTech.* 2025;26:196. doi:10.1208/s12249-025-03174-9.
48. Qiao C, Hu J, Jin Y, Li R, Zhao F, Zhang Y, *et al.* Artificial intelligence in pharmaceutical taste masking: taste prediction, excipient selection and formulation optimization. *Eur J Pharm Biopharm.* 2026;218:114934. doi:10.1016/j.ejpb.2025.114934.

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