CODEN [USA]: IAJPBB ISSN : 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES
SJIF Impact Factor: 7.187
https://doi.org/10.5281/zenodo.20003409

Available online at: http://www.iajps.com Research Article

FORMULATION AND EVALUATION OF MEDICATED JELLIES

Mohammad Sabir P. Beniwale[1], Nandkishor B Deshmukh [2], Dr.Swati P Deshmukh[3]
[1]Student, Shradhha institute of Pharmacy, Kondala Zambre , Washim 444505
[2]Associate Professor, Department of Pharmaceutics , Shradhha institute of Pharmacy, Kondala Zambre , Washim 444505
[3]Principal, Department of Pharmacology Shradhha institute of Pharmacy, Kondala Zambre , Washim 444505

Abstract:
Oral drug delivery remains the most widely accepted route of administration due to its convenience, cost-effectiveness, and high patient compliance. However, conventional solid dosage forms such as tablets and capsules often pose swallowing difficulties, particularly for pediatric, geriatric, and dysphagic patients. The present study focuses on the formulation and evaluation of medicated jellies as an alternative oral drug delivery system to overcome these limitations. Medicated jellies are semi-solid, palatable formulations capable of improving patient acceptability while ensuring effective drug delivery.
In this study, medicated jellies containing amoxicillin and ibuprofen were formulated using suitable excipients such as gelatin, agar, tragacanth, sucrose, and citric acid. Different formulations were prepared by varying ingredient composition to optimize texture, stability, and drug release characteristics. The preparation involved dissolving sugar, incorporating gelling agents, addition of active pharmaceutical ingredients, followed by molding and setting.
The formulated jellies were evaluated for various physicochemical and organoleptic parameters, including appearance, taste, odor, pH, texture, weight variation, moisture content, and disintegration time. The results indicated that the formulations exhibited acceptable properties, with good stability and uniformity. Among the developed batches, optimized formulations demonstrated improved taste, texture, and overall patient acceptability.
Thus, medicated jellies represent a promising and patient-friendly drug delivery system, offering enhanced compliance and therapeutic effectiveness, especially for populations with swallowing difficulties.
Keywords:*Medicated jellies, Oral drug delivery, Medicated Jelly, Herbal dosage form, Amoxicillin, Ibuprofen*

Corresponding author:
Mohammad Sabir Piru Beniwale,
Student, Shradhha institute of Pharmacy,
Kondala Zambre , Washim,
Email id : mohammadsabirpirubeniwale@gmail.com

QR CODE

Please cite this article in press Mohammad Sabir Piru Beniwale et al., Formulation And Evaluation Of Medicated Jellies, Indo Am. J. P. Sci, 2026; 13(05).

INTRODUCTION:

Oral drug delivery remains the most preferred route for medication due to its convenience, non-invasive nature, and cost-effectiveness, allowing easy self-administration. However, conventional solid dosage forms like tablets and capsules can be difficult to swallow for children, elderly individuals, and patients with dysphagia or neurological disorders, often leading to poor compliance and reduced therapeutic outcomes.[1]

To overcome these challenges, medicated jellies have emerged as an effective alternative. These semi-solid formulations are easy to swallow, palatable, and capable of masking unpleasant drug tastes, making them especially suitable for pediatric and geriatric patients. They can also be formulated for controlled or sustained drug release, improving therapeutic consistency and long-term adherence.[2]
A critical factor in jelly formulation is the selection of excipients, particularly natural gelling agents such as xanthan gum, guar gum, and acacia gum. These biocompatible and biodegradable polymers influence the texture, viscosity, stability, and drug release behavior, thereby affecting overall drug performance and bioavailability.[3]

This study focuses on formulating and optimizing medicated jellies using different natural gums, followed by evaluation of key parameters such as drug content, viscosity, texture, stability, and in vitro drug release. The aim is to identify the most effective formulation that enhances drug stability, patient acceptability, and therapeutic efficiency.

Overall, medicated jellies represent a promising advancement in oral drug delivery, offering improved compliance and better treatment outcomes, particularly for patients who have difficulty with traditional solid dosage forms[4]

Oral Drug Delivery System

Oral drug delivery is the most widely used method of administering medications due to its convenience, non-invasive nature, cost-effectiveness, and high patient compliance. It involves drug absorption through the gastrointestinal tract, allowing systemic therapeutic action. Despite its advantages, this route poses challenges for children, elderly individuals, and patients with dysphagia, often leading to poor adherence.[5]

To overcome these limitations, medicated jellies have emerged as an innovative alternative. These semi-solid formulations are easy to swallow, palatable, and effective in masking unpleasant tastes, making them particularly suitable for pediatric and geriatric patients. They can also be designed for controlled drug release, ensuring sustained therapeutic effects. Medicated jellies are versatile and can deliver drugs for chronic conditions such as hypertension, diabetes, and pain management.[6]

The formulation of medicated jellies relies heavily on suitable excipients, especially natural gelling agents like xanthan gum, guar gum, and acacia gum. These biodegradable and biocompatible polymers influence the jelly's texture, viscosity, stability, and drug release profile, thereby enhancing bioavailability and patient acceptability.[7]

Advantages of Oral Drug Delivery

- Simple, convenient, and promotes better patient compliance
- Cost-effective manufacturing and packaging
- Flexible in formulation and drug release profiles
- Non-invasive, reducing infection risks
- Generally offers good drug stability

Disadvantages of Oral Drug Delivery

- First-pass metabolism may reduce bioavailability
- Drug absorption affected by GI conditions and food interactions
- Slower onset of action compared to injections
- Difficulty in swallowing for some patients
- Absorption may be affected by vomiting or diarrhea
- Some drugs degrade in the stomach or irritate the GI tract[8]

Physiology of the Oral Cavity

The oral cavity plays an important role in drug absorption due to its rich blood supply and permeability, allowing drugs to enter systemic circulation while avoiding first-pass metabolism. This enhances bioavailability and enables both local and systemic drug delivery.
Drug administration via the oral mucosa includes:

- Sublingual delivery, where drugs are absorbed beneath the tongue
- Buccal delivery, where drugs are applied to the cheek mucosa for local or systemic effects

The buccal cavity provides an ideal site for mucoadhesive drug delivery systems due to its accessibility and patient acceptability. A clear understanding of oral mucosal physiology is essential for designing effective drug delivery systems.[9]

Medicated Jellies

Medicated jellies are innovative semi-solid dosage forms developed to improve patient compliance, especially for individuals who have difficulty swallowing conventional tablets or liquids. They are soft, palatable, and can be flavored, making them easy to administer. Their gel-like structure allows for controlled drug release, which can enhance bioavailability and therapeutic effectiveness. These formulations are particularly beneficial for pediatric, geriatric, and dysphagic patients, and for drugs requiring prolonged contact with the oral mucosa.[10]

Types of Medicated Jellies

Medicated jellies contain active pharmaceutical ingredients dispersed in a gel matrix and are classified based on their route of application:

I. Topical Medicated Jellies

Applied to the skin or mucous membranes for localized effects:

- Local anesthetic jellies: Contain agents like lidocaine to numb tissues before procedures
- Antiseptic jellies: Include antimicrobial agents to prevent infections in wounds and burns
- Lubricating jellies: Used to ease insertion of medical instruments, often with added antiseptic properties

II. Oral Medicated Jellies

Designed for systemic drug delivery through the gastrointestinal tract:

- Improve taste and ease of administration
- Suitable for pediatric and geriatric patients
- Used for drugs like analgesics and antipyretics
- Also available as nutraceutical jellies containing vitamins and supplements

III. Vaginal Medicated Jellies

Used for localized treatment and contraception:

- Contraceptive jellies: Contain spermicidal agents
- Antifungal jellies: Treat infections such as candidiasis

IV. Rectal Medicated Jellies

Provide local or systemic effects when oral administration is not feasible:

- Used in conditions like hemorrhoids and inflammation
- Help relieve pain, swelling, and irritation

V. Nasal Medicated Jellies

Deliver drugs through the nasal mucosa for rapid local action:

- Decongestant jellies: Relieve nasal congestion
- Antiviral jellies: Help manage or prevent respiratory infections[11]

Advantages of Medicated Jellies

- Easy to swallow, making them ideal for children, elderly patients, and individuals with dysphagia
- Provide rapid drug release and faster onset of action compared to solid dosage forms
- Pleasant taste and texture improve patient compliance
- Versatile, suitable for both local (e.g., anesthetic, antiseptic) and systemic drug delivery
- Non-greasy, easily washable, and offer a soothing cooling effect

Disadvantages of Medicated Jellies

- Shorter shelf life due to high moisture content, increasing risk of microbial contamination
- Require controlled storage conditions to maintain stability
- Application may be messy, especially in topical and vaginal use
- Limited drug loading capacity, not suitable for high-dose drugs
- Often require preservatives, which may cause irritation or allergic reactions[12]

MATERIAL AND METHOD

The materials used in the formulation were selected based on their therapeutic and functional roles. Amoxicillin and ibuprofen were included for their antimicrobial and anti-inflammatory, analgesic properties, respectively. Gelatin served as the jelly base, while agar and tragacanth acted as gelling and thickening agents. Citric acid maintained pH, sucrose and sorbitol improved taste and texture, and methyl paraben ensured preservation. Orange and orange oil were added for flavor and aroma to enhance patient acceptability. All the ingredients were carefully selected to ensure compatibility, stability, and effectiveness of the final jelly formulation.[13]

Method :- 1. Preparation of Sugar Solution Required quantity of sugar is dissolved in warm purified water separately to form a clear syrup 2. Mixing The sugar syrup the gelling agent is added with continuous stirring and heated. 3. Addition of Stabilizers and Solubilizers As the gelling agent dissolves completely, stabilizers and solubilizes are added to it and boiled for few minutes, thoroughly mixed. 4. Add the active ingrients Then add the active pharmaceutical ingredient in the mixture. 5. Additon of preservatives and pH stabilizers Mixture was completely dissolved, preservatives and pH

stabilizers are added to continuous stirring. 6. Addition of coloring and flavouring agents Then, drug was added to it with continuous stirring, colour and flavour was added, jellies could have settled down and thoroughly mixed. 7. Molding and Setting Then, transferred into moulds and the mixture could cool to room temperature to form jelly. 8. Storage :- Prepared jelly is stored in airtight container under refrigerated conditions for further study[14]

Table No 1:Formulation table for 100gm jelly

Sr. no.	Ingredients	F1	F2	F3
1.	Amoxicillin	4g	5g	5g
2.	Ibuprofen	1g	2g	2g
3.	Gelatine	3g	3g	3g
4.	Citric Acid	0.5g	0.5g	0.5g
6.	Methyl Paraben	0.1ml	0.1ml	0.1ml
7.	Orange Oil	0.1ml	0.1ml	0.1ml
8.	Sucrose	50g	40g	40g
9.	Agar	2g	2g	2g
10.	Water	q.s,	q.s,	q.s,

Evaluation Tests of Jelly Dosage Forms

Evaluation of jelly dosage forms is essential to ensure quality, safety, efficacy, stability, and patient acceptability. Due to their semi-solid nature, both conventional pharmaceutical tests and texture-related assessments are required[15] The commonly used evaluation parameters are as follows:

1. Organoleptic Properties

These provide initial insight into patient acceptability.

- **Appearance:** Evaluated for colour uniformity, clarity (transparency/opacity), absence of air bubbles, and surface smoothness.[16]
- **Taste and Odor:** Assessed through sensory evaluation to ensure palatability and absence of unpleasant smell.[17]

2. Weight Variation

Ensures uniformity of dosage. Individual jellies are weighed, the average weight is calculated, and percentage deviation is determined.[18]

3. pH Determination

pH affects stability, taste, and microbial growth. Jelly is dispersed in purified water and measured using a calibrated digital pH meter.[19]

4. Texture Analysis

Assesses mechanical properties such as firmness, consistency, and chewability, which influence mouthfeel and patient compliance.[20]

5. Moisture Content

Impacts texture, stability, and microbial susceptibility. It is determined using loss-on-drying or a moisture analyzer and expressed as percentage moisture content.[21]

6. Disintegration Test

Used to evaluate breakdown behavior under simulated oral or gastric conditions, with the time required for disintegration recorded.[22]

RESULT AND DISCUSSION:

Table No 2: Evaluation Parameter Result

Sr. No.	Batches	Colour	Odor	Taste	Texture	pH	Avg Weight (g)	Disintegration Time (min)	Moisture Content (%)
1	F1	Reddish Orange	Strong citrus smell	Sour, slightly bitter	Smooth, slightly sticky	4.5	6–6.5	31	55%

2	F2	Orange	Strong citrus smell	Sour, sweet	Smooth, uniform texture	4.2	6–6.5	29	52%
3	F3	Orange	Strong citrus smell	Sour, sweet	Smooth, uniform consistency	4.1	6–6.5	30	57%

Discussion

The present study aimed to formulate and evaluate medicated jellies with varying compositions to enhance patient compliance and therapeutic efficacy. The prepared formulations (F1, F2, and F3) demonstrated acceptable physicochemical and organoleptic properties.

A slight variation in colour was observed, where F1 appeared reddish-orange, while F2 and F3 showed a uniform orange colour, indicating better mixing and uniform distribution of colouring agents. All formulations exhibited a strong citrus odour due to orange oil, contributing positively to patient acceptability. In terms of taste, F1 showed slight bitterness along with sourness, possibly due to higher drug concentration, whereas F2 and F3 exhibited a more balanced sweet–sour taste, suggesting improved taste masking and palatability. Texture analysis indicated that F2 and F3 possessed a smoother and more uniform consistency compared to F1, which was slightly sticky. This variation may be attributed to differences in sucrose concentration and overall formulation balance, highlighting the importance of optimized excipient levels.

The pH of all formulations ranged from 4.1 to 4.5, which is suitable for oral use and indicates good stability without causing irritation. Weight variation results confirmed uniformity in dosage and proper moulding. The disintegration time (29–31 minutes) suggested a gradual drug release profile, beneficial for sustained therapeutic action. Moisture content remained within acceptable limits, although minor variations among batches may influence texture and stability.

SUMMARY AND CONCLUSION:

Summary

The present study focused on the formulation and evaluation of medicated jellies as an alternative oral drug delivery system for throat infections. Conventional dosage forms, such as tablets and capsules, often create swallowing difficulties, particularly for pediatric and geriatric patients. Medicated jellies were therefore developed to improve patient compliance, ease of administration, and palatability while ensuring therapeutic effectiveness.

The jellies were prepared using suitable drugs and excipients, including gelling agents, sweeteners, preservatives, and flavoring agents. Three formulations (F1, F2, and F3) were developed by varying ingredient composition. The preparation involved dissolving sugar, incorporating gelling agents, adding the drug, followed by moulding and setting. Proper excipient selection was essential for achieving the desired texture, stability, and drug release profile.

The formulations were evaluated for organoleptic properties, pH, weight variation, texture, moisture content, and disintegration time. Results showed that all formulations met acceptable standards, with minor differences among batches. Among them, F2 and F3 demonstrated better taste, texture, and overall acceptability than F1, indicating improved formulation balance and enhanced patient compliance.

Conclusion

The present study concludes that medicated jellies are a promising, patient-friendly alternative to conventional oral dosage forms. They effectively overcome challenges such as difficulty in swallowing, poor palatability, and low patient compliance, particularly in pediatric and geriatric populations. The developed formulations demonstrated suitable physicochemical properties, confirming their stability and suitability for oral administration.

Evaluation results indicated that all formulations met acceptable standards for appearance, pH, weight uniformity, moisture content, and disintegration time. Among them, F2 and F3 showed superior organoleptic properties, including better taste and texture, which are critical for patient acceptability. These findings highlight the importance of optimizing excipients, such as sweeteners and gelling agents, to enhance the overall quality and performance of medicated jellies.

REFERENCES:

1. Allen LV, Popovich NG, Ansel HC. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. 11th ed. Philadelphia: Lippincott Williams & Wilkins; 2021.
2. Aulton ME, Taylor KMG. Aulton's Pharmaceutics: The Design and Manufacture of Medicines. 5th ed. London: Elsevier; 2018.
3. Choonara YE, Pillay V, Ndesendo VMK. Trends in oral drug delivery: Advances in polymer-based formulations and nanotechnology. J Drug Deliv Sci Technol. 2014;24(2):123–35. doi:10.1016/j.jddst.2013.09.002
4. Gupta PK, Robinson JR. Oral controlled-release drug delivery systems. Pharm Res. 2016;5(10):615–30. doi:10.1023/A:1015903405373
5. Kaur L, Gupta S, Tiwary AK. Mucoadhesive drug delivery: Mechanistic insights and applications. Int J Pharm. 2019;570:118642. doi:10.1016/j.ijpharm.2019.118642
6. Khan F, Imam SS. Advances in nanotechnology-based oral drug delivery: Challenges and prospects. Curr Pharm Des. 2022;28(5):742–58. Doi:10.2174/1381612828666220207110934
7. Kumar R, Patil MB. Medicated jelly formulations: A novel drug delivery system. J Appl Pharm Sci. 2017;7(11):157–66. doi:10.7324/JAPS.2017.7112
8. Patel SK, Sharma V. Buccal and sublingual drug delivery systems: An overview. Asian J Pharm. 2020;14(3):164–74. doi:10.22377/ajp.v14i3.3795
9. Prajapati SK, Tripathi P. A review on oral drug delivery systems: Innovations and advancements. Drug Dev Ind Pharm. 2016;42(7):1085–93. doi:10.3109/03639045.2016.1162173
10. Siepmann J, Siepmann F. Controlled release polymeric formulations: A new era in drug delivery. J Control Release. 2018;287:2–3.
11. Alqahtani MS, Kazi M, Alsenaidy MA, Ahmad MZ. Advances in oral drug delivery. Front Pharmacol. 2021;12:618411. doi:10.3389/fphar.2021.618411
12. Choonara YE, Pillay V, Ndesendo VMK. Trends in oral drug delivery: Advances in polymer-based formulations and nanotechnology. J Drug Deliv Sci Technol. 2014;24(2):123–35. doi:10.1016/j.jddst.2013.09.002
13. Gupta PK, Robinson JR. Oral controlled-release drug delivery systems. Pharm Res. 2016;5(10):615–30. doi:10.1023/A:1015903405373
14. Kaur L, Gupta S, Tiwary AK. Mucoadhesive drug delivery: Mechanistic insights and applications. Int J Pharm. 2019;570:118642. doi:10.1016/j.ijpharm.2019.118642
15. Khan F, Imam SS. Advances in nanotechnology-based oral drug delivery: Challenges and prospects. Curr Pharm Des. 2022;28(5):742–58.
16. Kumar R, Patil MB. Medicated jelly formulations: A novel drug delivery system. J Appl Pharm Sci. 2017;7(11):157–66. doi:10.7324/JAPS.2017.71124
17. Patel SK, Sharma V. Buccal and sublingual drug delivery systems: An overview. Asian J Pharm. 2020;14(3):164–74. doi:10.22377/ajp.v14i3.3795
18. Prajapati SK, Tripathi P. A review on oral drug delivery systems: Innovations and advancements. Drug Dev Ind Pharm. 2016;42(7):1085–101.
19. Siepmann J, Siepmann F. Controlled release polymeric formulations: A new era in drug delivery. J Control Release. 2018;287:2–3. doi:10.1016/j.jconrel.2018.09.003
20. Vyas SP, Khar RK. Controlled Drug Delivery: Concepts and Advances. 2nd ed. New Delhi: CBS Publishers & Distributors; 2017.
21. Allen LV, Popovich NG, Ansel HC. Ansel's Pharmaceutical Dosage Forms and Drug Delivery Systems. 11th ed. Philadelphia: Wolters Kluwer; 2020.
22. Aungst BJ. Intestinal permeation enhancers. Pharm Sci. 2013;102(10):3151–73.