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FORMULATION AND EVALUATION OF POLYHERBAL MEDICATED JELLY

Pranjali Indian, Anjali Indian, Aafreen

Shri Ram Murti Smarak College of Engineering and Technology

ABSTRACT: Boost Immunity is the need of the hour as it helps to fight several diseases and microbial infections. Recently witnessed Covid 19 infection where several people lost their life due to the lack of required immunity against the viral infection. Drinking kadha is a natural way of boosting immunity. Making kadha is a tedious and time-consuming process and also the proper dosing of the ingredients in making is impossible. So here we develop a formulation that is easy to consume, especially for pediatrics and geriatrics patients. And provides benefits equivalent to drinking kadha. The Chewable formulation has the benefits of being aesthetically pleasing, having a decent texture, and not requiring water for ingestion. Solid, one-dose formulation of soft chew. Since it is a mobile drug delivery system, it is useful for acute medicine. They are made utilizing a heating and congealing process. It functions as a unique dosage form with numerous uses in dietary supplements, over-the-counter medications, and pharmaceuticals.

KEYWORDS: Medicated jelly; Pediatric; Geriatric; Immunity

INTRODUCTION:

Transparent or translucent, non-greasy, semisolid preparations intended for both internal and external use are referred to as jelly. Instead, jellies are water-soluble bases made from natural ingredients such as tragacanth, pectin, alginates, and boro glycerin, as well as from artificially produced versions of those same ingredients like cellulose and sodium carboxymethylcellulose.[1]

The medicated jelly is primarily used to treat both systemic and oral disorders. Because it resembles sweets, it is beneficial for children and people with psychosis. They may easily take this drug because of its appealing color and sweet flavor, and they like chewing the jelly's various forms and sizes. [2] Gelatin is typically used to make jellies. The substance dissolves in hot water, and upon cooling in the refrigerator, gelation takes place at roughly 25 °C, the gelatin molecules in solution go through a transition from the coil to helix, and the helices assemble to form a gel. High-clarity gels are produced, which melt when heated to 37°C, or body temperature to provide rapid flavor release and smooth texture, the jelly melts in the mouth. However, they are prone to toughening when stored. Gums like pectin, alginates, and xanthan gum can also be used to make jellies.[3]There are several sorts of jellies, including the following: 1. Medicated jelly: Because of its spermicidal, local anesthetic, and antiseptic characteristics, this jelly is mostly utilized on mucous membranes and skin. These jellies have an adequate amount of water. Jellies have a local cooling effect once the water has evaporated, and any remaining layer offers protection. As an illustration, ephedrine sulfate jelly is employed as a vasoconstrictor to stop nosebleeds. 2. Lubricating jelly: This type of jelly is used to grease diagnostic tools like surgical gloves, cystoscopes, and catheters. 3. Another jelly: This is used for many tasks including patch testing and electrocardiography. [4]

Fig 1: Showing different types of jelly
A] MEDICATED JELLY B] LUBRICATING JELLY C] MISCELLANEOUS

Fig 2: Showing different formulation excipients

MEDICATED JELLY FORMULATION

Table 1: Showing formulation of medicated jelly

S.NO.	Ingredients	Characteristics
1	**API**	All immunity-boosting vitalizer like Lemon, ginger, black pepper, tulsi, turmeric, giloy, cinnamon, ashwagandha, ginseng, and beetroot. They all are rich sources of antioxidants.
2	**Gelling Agent**	Typically, hydrocolloids are suitable for creating gel-like matrixes. These colloid-based dissolving gelling agents create a weakly cohesive internal structure when they dissolve in the liquid phase. Examples of gelling agents include the following: (a) Sodium alginate- In a variety of topical formulations, including pastes, creams, and gels, sodium alginate is typically utilized as a thickening and suspending ingredient. Moreover, it is utilized in culinary and cosmetic items. [5] (b) Pectin- Since it is less expensive, it is employed in a variety of drug delivery systems, including colon-specific, mucoadhesive, gastroprotective ,and controlled release. Cosmetics also use it as a stabilizer. [6] (c) Tragacanth-utilized in foods and pharmaceuticals as a thickening, stabilizer, and texture ingredient. [7] (d) Gelatin -In pharmaceutical preparation, vitamin capsules, cosmetic technology, and photographic emulsions, gelatin is typically utilized as a gelling agent. Drugs suspended in a biodegradable matrix are also delivered using this method in implanted delivery systems. [8] (e) Carrageenans - Vegetarian carrageenan is utilized in confections as a gelatin alternative. Carrageenan comes in three primary varieties with varying levels of sulfation. One sulfate group is present in kappa-carrageenan, two sulfate groups are present in iota-carrageenan, and three sulfate groups are present in lambda-carrageenan per disaccharide. [9]
3	**Sweeteners**	Dextrose (70 percent as sweet as sucrose[11]), Sorbitol (60 percent as sweet as used as a humectant & thickener in cosmetics, used as a laxative, used in the formulation of soft gel capsules, and in the treatment of hyperkalemia. [11]), Saccharin, and Sucrose are all commonly used together to prevent crystallization (artificial sweetener [10]).

4	**Coloring Agent**	Colorants are employed to provide dose forms an attractive appearance and to promote patient acceptance. to maintain the consistency of the preparation that contains raw components that are not all the same color. Also used to coordinate the flavoring in the formulation. aid in the differentiation and recognition of products. Three types of colorants: FD&C, D&C, and others.
5	**Preservatives**	Preservation is essential to maintain the product's shelf life and prevent any incompatibilities between gelling chemicals. Preservatives are the primary used for most cellulose derivatives. Methyl paraben, propyl paraben, benzoic acid, benzalkonium chloride, and chlorhexidine acetate are a few examples. [13]
6	**Flavouring Agent**	First, the intrinsic flavor of the active ingredient is assessed to determine its potential impact on the formulation, and only then is a final selection made based on how the components affect the formulation's pharmacological and organoleptic features. [12] Acidic Taste: Orange, lemon, cherry, and grapefruit flavors are used. Orange, anise, and lemon flavors are used to flavor bitter food.
7	**Stabilizers**	Stabilizers are typically included to keep a product's beneficial qualities up until the customer consumes it. These chemicals are included in jellies to stop drying. Sorbitol and propylene glycol are two examples of stabilizers. Chelating agents, such as EDTA, are included to prevent any interaction between the base or medication and heavy metals. [14]

Material and Method

Table 2: Preparation of medicated jelly

INGREDIENTS	QUANTITY	PROPERTIES
Lemon	5ml	Anti-oxidant, sources of vitamin C
Dry ginger	1 - 2g	Relieves cough, Anti-oxidant, Anti-bacterial, Anti-viral
Black pepper	250mg - 1g	Anti-inflammatory
Tulsi	2-3 g	Anti-pyretic, immunity booster
Turmeric	0.7 mg	Anti-inflammatory, Anti-bacterial, immunity-boosting properties
Cinnamon	1-3g	Anti-oxidant, Anti-viral
Giloy	2.5 ml	Cardio-protective, immuno-modulator, Hepato-protective, Anti-diabetic
Ashwagandha	1-2g	Reduce Stress, Support sleep cycle, boost immunity
Ginseng	1mg	Rich source of zinc
Beetroot	2-3ml	Rich Sources of vitamins B9, A, and C, and control cholesterol levels

METHOD OF PREPARATION OF MEDICATED JELLY

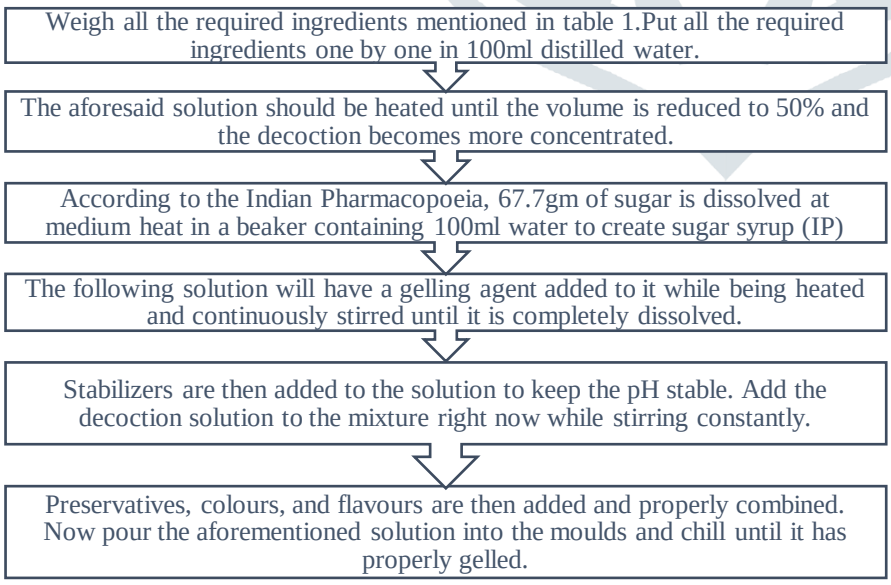

Fig 3: Showing procedure of medicated jelly

CHARACTERISATION[15]

1. Physical Appearance: The physical appearance including clarity, precipitation, homogeneity as well as other features of the prepared jellies were observed that showed all jellies were clear, yellow in color, having semisolid consistency, homogenous, and have a pleasant fruity aroma.

2. Stickiness and grittiness: The formulations should be visually inspected for stickiness and grittiness by gently rubbing a jelly sample between two fingers.

3. pH: At room temperature, the jellies' pH was measured using a digital pH meter. For this, 50 ml of distilled water should be mixed with 0.5 g of jelly to create a 1% solution, and the pH should be recorded. Both stability and flavor are influenced by the finished jelly's pH, in addition to both.

4. Pourability of the mixture: The jelly mixture should be simple to pour into the molds. Trisodium citrate, a buffer salt (retarder) that interferes sterically with the pectin molecules' approach during the hot phase and raises pH levels before the addition of acid to prevent pre-gelation, is a key player in this process. The longer the setting time and the lower the set temperature, which allows enough time for the jelly to be poured and set, the higher the buffer salt concentration, or retarder, concentration. [16]

5. Viscosity study: Using a Fungal lab viscometer, the viscosity of the jelly was measured; the system should be non-newtonian spindle number 4. It was monitored for a set amount of time—2 minutes at 1.5 rpm and 250–50 C.

6. Texture analysis: With two fingers, press the gel surface in this method. To mimic a finger pressing into the sample, a hemispherical probe with a diameter of 12 mm was used. A load cell that evaluates sample response about probing penetration is directly attached to the traveling probe. [18]

7. Content uniformity: Jelly from each formulation was first taken, crushed, and combined. The mixture's drug equivalent was extracted using the proper medium. The amount of drug present in each extract was assessed using a suitable analytical method, or the absorbance of each solution should be measured using a UV-visible spectrophotometer at an appropriate wavelength. This test checks that each dosage form in the batch has the same amount of medicinal compounds, or "active pharmaceutical ingredients," in it.

8. In-vitro dissolution study: 370C ± 0.50C and 50 rpm were maintained in the USP paddle-type apparatus used for the in-vitro dissolution investigation utilizing the dissolving media (900ml). 5 ml of the sample should be removed, diluted up to 10 ml in a volumetric flask with the same, and removed 10, 20, 30, 40, 50, 60, 90, and 120 minutes later. The sink condition should be maintained by replacing the removed 5 ml of sample with new media. By employing an appropriate analytical method or a UV spectrophotometer, the sample's drug content was determined. After measuring absorbance, the percentage of drug release was estimated.

9. Syneresis: It is when the gel contracts after being stored and the water separates from the gel. It is more noticeable in the gels if a low dose of the gelling agent is used. At room temperature (25°C 5°C) and 8°C 1°C, all the jellies were examined for indications of syneresis. Synergistic formulations were rejected and not chosen for additional research. [16]

10. Spreadability: To determine spreadability, jelly (2.5 g) was placed between two glass slides and crushed to the desired thickness by holding a 1000 gm weight for five minutes. The measure of spreadability was the number of seconds required to separate two slides. Spreadability was better when the distance of 7.5 cm was covered in less time.

$S = W \times L/T$

Where, S = spreadability,

W = weight tide to upper slide,

L= length of a glass slide (7.5cm),

T= time required to separate 2 slides.

RESULT AND DISCUSSION:

Table 3: Showing different evaluation parameters

S.no	Evaluation Parameter	Inference
1.	Color	Reddish brown
2.	Odor	Fruity aroma
3.	Appearance	Translucent
4.	Consistency	Semisolid
5.	Texture	Smooth
6.	Stickiness	Non-sticky
7.	Grittiness	No-gritty
8.	pH	3-3.5
9.	Spreadibility(gm.cm/sec)	21.35
10.	In-vitro dissolution study	90%
11.	Content uniformity	98.89±0.56

12.	Syneresis	no syneresis in all jellies after 24 hrs.
13.	Viscosity	143.58±0.1
14.	Texture analysis	Smooth and Soft consistency

CONCLUSION AND FUTURE PERSPECTIVE:

Patient-compliant dose forms are preferable to conventional ones due to the recent development of oral medicated jellies formulations that are easily absorbed by patients with dysphagia, children, and geriatric patients. The formulation is a revolutionary method that seeks to increase efficacy and safety. The manufacture of formulations calls for the use of a variety of excipients and gelling agents, as well as sugar syrup, which adds sweetness or improves the formulation's acceptability in the present generation of youngsters who like jelly sweets. Kadha has been used for a long time and has the potential to assist the body in recovery from cold and flu infection with enhanced immunity [19]. The Kadha Candy concludes with dozens of health benefits such as antiviral, antioxidant, anti-platelet, and reno-protective properties, anti-atherosclerotic anti-inflammatory, and hepato-protective, and enhances immunity to regulate various diseases and viral infections.

REFERENCES:

1.Lachmann L, Lieberman HA and Kanig JL: Theory andPractice of Industrial Pharmacy. 3rd Edition.Bombay:Varghese Publishing House 1991: 368.

2. Gennaro AR: Remington: The Science and Practice of Pharmacy, vol-II, 20th Edition, 2000; 733.

3. Kaur G: A review article on oral jellies for pediatrics, IndoAmerican J of Pharmaceutical Sci 2018; 05(01): 444.

4. Imai K. Alendronate Sodium Hydrate (Oral Jelly) for the Treatment of Osteoporosis: Review of a Novel, Easy to Swallow Formulation. Clin Interv Aging, 2013; 8: 681-8.

5. Taranum R, Mittapally S. Soft chewable drug delivery system: oral medicated jelly and soft chew, Journal of Drug Delivery and Therapeutics. 2018; 8(4):65-72 DOI: http://dx.doi.org/10.22270/jddt.v8i4.1784

6. May, C.D. (1997). Pectins. In: Imeson, A.P. (eds) Thickening and Gelling Agents for Food. Springer, Boston, MA. https://doi.org/10.1007/978-1-4615-2197-6_11.

7. Mohammad Nejatian, Soleiman Abbasi, Fatemeh Azarikia, Gum Tragacanth: Structure, characteristics and applications in foods,International Journal of Biological Macromolecules,Volume 160,2020,Pages 846-860, ISSN 0141-8130,https://doi.org/10.1016/j.ijbiomac.2020.05.214.

8. Lin Lin, Joe M. Regenstein, Shun Lv, Jianfeng Lu, Shaotong Jiang, An overview of gelatin derived from aquatic animals: Properties and modification, Trends in Food Science & Technology, Volume 68,2017, Pages 102-112,ISSN 0924-2244,https://doi.org/10.1016/j.tifs.2017.08.012.

9. Liang Li, Rui Ni, Yang Shao, Shirui Mao ,Carrageenan and its applications in drug delivery, Carbohydrate Polymers ,Volume 103, 2014, Pages 1-11,ISSN 0144-8617,https://doi.org/10.1016/j.carbpol.2013.12.008.

10.Debojyoti B, organoleptic agents: adaptability, acceptability, and palatability in formulations to make it lucrative. World Journal of Pharmaceutical Research .2015; (4):1573-1586.

11. Renu, Jyoti D, Chewable Tablets: A Comprehensive Review, The Pharma Innovation Journal, 2015; 4(5):100-105.

12. Eric D, Frank T, Grant E, Sweeteners: discovery, molecular design, and chemoreception, Food/Nahrung, 1991;35(10):1046.

13. Maria Manuela Silva, Fernando Cebola Lidon. Food preservatives – An overview on applications and side effects. Emirates Journal of Food and Agriculture. 2016. 28(6): 366-373.doi: 10.9755/ejfa.2016-04-351

14. Raja Manali M, Dhiren P, Oral medicated jelly: a recent advancement in formulation, An international journal of pharmaceutical sciences, 2016; 7(2):13-20.

15. Seth AK. Pharmaceutics –Ii (Dispensing and Formulation). S Vikas& Co., JalandharCity, 287 -290.

16. Shirse P. Formulation and Evaluation of Oral Medicated Gelly Containing CyclodextrinInclusion Complexed Water Insoluble Drug – Glimepiride; IJPRD, 2011; 4(4): 142-153.

17. Patil AN, Chaudhary S, Shah H. Formulation and Evaluation of LevocetrizieDihydrochloride Soft Gel for Oral Administration; IJPRBS, 2016; 5(2): 178-198.

18. Raja Manali M.: Oral Medicated Jelly: A Recent Advancement in Formulation. International Journal Of Pharmaceutical Sciences, 2016; 7(2): 13-20.

19. Maurya, D.K, Sharma, D., 2020. Evaluation of Traditional Ayurvedic Preparation for prevention and management of the novel coronavirus (SARS-Cov-2) using molecular docking approach.Chem.Rxiv.