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STANDARDISATION OF *DRAKSHADI LEHA GUMMIES*

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INTRODUCTION:

Ayurveda, as a traditional system of medicine, applies a holistic approach not only in treatment but also in drug manufacturing, where formulations are prepared using natural ingredients and time-tested processes to ensure efficacy, safety, and balance of therapeutic properties.⁽¹⁾

Ayurveda emphasizes the use of classical formulations for the management of diseases like *Pandu Roga* (iron deficiency anemia), focusing on restoring balance and improving overall vitality. ***Drakshadi Leha*** is one such traditional polyherbal preparation known for its *Rasayana* (rejuvenative) and *Balya* (strength-promoting) properties, which help in improving hemoglobin levels and general health.

However, conventional *Leha* formulations may have limitations in terms of palatability and patient compliance, especially among children and elderly patients. To overcome these challenges, the present formulation approach involves converting *Drakshadi Leha* into a gummy dosage form, which is more acceptable, convenient, and easy to administer.

In Ayurveda, anemia is closely related with *Pandu Roga* based on the similarity in their clinical features and presentation. The term *Pandu* denotes a state of pallor or abnormal discoloration of the body, often described as a whitish or yellowish hue resembling the color of pollen from the *Pandanus odoratissimus*, flower. This characteristic change in complexion is considered a key feature of the disease. *Pandu Roga* has been comprehensively described in classical Ayurvedic texts since ancient times.⁽²⁾

In 2015 WHO reported 24.8% of the world's population is affected by anemia, 42% were pregnant women, 30% non - pregnant women and 47% were preschool children.(3) In contemporary practice, numerous medicinal formulations are described in both classical Ayurvedic texts and modern medicine. However most allopathic iron supplements are known to irritate the gastrointestinal tract and are commonly associated with side effects such as nausea, abdominal discomfort, and constipation. Among them, ferrous sulphate is particularly noted for causing more pronounced gastrointestinal disturbances, including gastritis, constipation, and diarrhea.

Among the various available options in the ayurvedic texts, **Drakshadi Lehya** has been selected for its therapeutic potential.

Therefore considering the burden of anaemia in present generation and in the modern management like side effects, poor compliance of supplements and to increase the palatability and tolerance, present work determines the dose modification of *drakshadi Avaleha* into gummy form was conducted.

Gummies explore the implicit benefits of taste masking, easy swallowing, don't have unusual smell and also pediatrics, geriatrics as well as patients associated with tooth issues can easily consume gummies. This medicine delivery system provides patient benefits and compliance, offering several advantages over tablets or liquid phrasings in that, the remedial dosage form isn't be swallowed and this increases patient compliance, especially for elders and pediatrics with swallowing diseases;

Also, the product can be taken anywhere and at any time it is prone to spillage when handled. Gummy supplements often provide similar benefits to their traditional multivitamins or other dietary supplement equivalents, due to generally comprising the same active ingredients. The primary benefit of gummy supplements over their counterparts, however, is their imitation of candy, providing a pleasant taste and easy-to-consume nature, which appeals to many children and adults who may not like swallowing pills.⁽⁴⁾

DRUG PROFILE⁽⁶⁾:

In classical Ayurvedic texts, **Drakshadi Leha** is described as a traditional formulation indicated for the management of *Pandu*, *Kamala*, and *Halimaka*. It is a polyherbal preparation composed of specific ingredients known for their therapeutic properties in improving hemoglobin levels, enhancing digestion, and promoting overall health.

Sr.No.	Ingredients	Botanical Name	Family	Parts Used	Amount
1	Draksha	<i>Vitis vinifera</i> L.	vitaceae	Fruit	1Prasth
2	Pippali	<i>Piper longum</i>	Piperaceae	Fruit	1Prasth
3	Yashtimadhu	<i>Glycerhiza glabra</i> Linn.	leguminosae	Root	2Pal
4	Shunti	<i>Zinziber officinal</i> Rosc.	Zingiberaceae	Rhizome	2Pal
5	Vanshlochan	<i>Bambusa arundinacia</i>	Gramineae	Concretion from Bamboo	2Pal
6.	Amalaki	<i>Embllica Officinalis</i> Gaertn.	Euphorbiaceae	Fruit	1 Droan
7.	Sharkara				1/2Tula
8.	Madhu				1Prasth

MATERIAL AND METHOD:

The initial step of the study involved the preparation of the herbal decoction (*Kwath*) using *Yashtimadhu* (*Glycyrrhiza glabra*), *Peepali* (*Piper longum*), *Shunti* (*Zingiber officinale*), *Vanshlochan* (*Bambusa arundinacea*), and *Draksha* (*Vitis vinifera*). The drugs were collected and physically cleaned to remove impurities; some were washed with water and then wiped clean with a cloth.

The aqueous extracts (*Kwath*) of *Yashtimadhu*, *Peepali*, *Shunti*, *Vanshlochan*, and *Draksha* were prepared by boiling the plant materials in 16 th parts of water and reduced to 1/4th and then it was filtered with muslin cloth. From the *Draksha*, fresh juice (*Swaras*) was extracted and set aside for further use.

After the preparation of the decoctions, *Sharkara* (sugar) and *Madhu* (honey) were added to the mixture along with *Draksha Swaras*. The mixture was heated gently to form a homogenous semi-solid base suitable for gummy formulation. *Amalaki* (*Embllica officinalis*) was incorporated as a powder or extract to enrich the formulation with additional therapeutic benefits and improve palatability.

The final mixture was poured into molds and allowed to set at room temperature to form gummies. Once set, the gummies were stored in airtight containers at room temp. for further evaluation and experimental use.

FORMULATION OF GUMMIES:

We conducted a systematic experimental phase involving five different batches of formulation composition ratios for optimizing gummy texture and stability. By varying the ratios of gelling agents, sweeteners and others ingredients finally led to optimum consistency and stability required for a standard benchmark. The table-1 shows the compositions of different batches.

INGREDIENTS	FORMULA 1	FORMULA 2	FORMULA 3	FORMULA 4	FORMULA 5
Superfine Sugar	47 gm	47gm	20gm	12gm	30gm
Gelling Agent	9 gm	10gm	60 gm	67gm	10gm
<i>Kwath</i>	3.13 ml	3.13ml	40 ml	40ml	20ml
<i>Amalki Swaras</i>	62.6 ml	62.6ml	80 ml	120ml	40ml
Citric Acid	1 gm	1gm	1 gm	1gm	1gm

Table no. 1(distribution of quantity of ingredients used)

PROCEDURE:

The preparation of the *Drakshadi* gummies was executed by integrating traditional *Bhaishajya* Kalpana principles with modern confectionery technology. The procedure was divided into three primary phases: media preparation, hydrocolloid activation, and thermal concentration.

1) Preparation of the Bioactive Liquid Media

The liquid phase was composed of a synergistic blend of *Swarasa* (fresh expressed juice) and *Kwatha* (decoction). Specifically, 60 ml of *Amalaki Swarasa* was combined with 40 ml of a concentrated decoction containing *Yashthimadhu* (*Glycyrrhiza glabra*), *Shunthi* (*Zingiber officinale*), *Vamshalochana* (*Bambusa arundinacea*), *Pippali* (*Piper longum*), and *Draksha* (*Vitis vinifera*). This 100 ml bioactive medium served as the solvent for the gelling agent.

2) Hydrocolloid Blooming and Solubilization

To initiate the gelling process, 10 g of pharmaceutical-grade gelatin was added to the cold liquid media. The mixture was allowed to "bloom" to ensure complete hydration of the protein granules. Following hydration, the mixture was transferred to a stainless-steel vessel and subjected to controlled heating on a digital hot plate.

3) Thermal Processing and Final Formulation

The temperature was gradually increased to 75°C while maintaining constant agitation to achieve a homogenous solution. Once the gelatin was fully solubilized, 30 g of *Sharkara* (superfine sugar) was incorporated into the mixture. The solution was further heated to facilitate the total dissolution of the sugar and to drive off excess moisture. In this stage one gm of citric acid was poured for maintaining preservation.

To achieve the desired consistency and ensure microbial stability, the temperature was briefly elevated to 105°C. This high-temperature phase served to increase the total soluble solids (TSS) and reached the "firm ball" stage of confectionery crystallization.

4) Molding and Set-up

Upon reaching the target temperature and consistency, the mixture was immediately removed from the heat source to prevent over-caramelization or degradation of the thermo-labile phytoconstituents. The molten mass was then poured into food-grade silicone molds and allowed to undergo setting.

PICTURES:



DISCUSSION:

The preparation of *Drakshadileha* gummies represents a thoughtful and effective integration of traditional Ayurvedic knowledge with contemporary pharmaceutical technology. By incorporating both *Swarasa* (fresh juice extract) and *Kwatha* (decoction), the formulation captures a wide range of active phytoconstituents present in the raw herbal ingredients.

From a formulation perspective, meticulous attention was given to key processing parameters such as gelatin blooming, controlled heating, and proper sugar incorporation and melting. These steps are critical in achieving the desired gummy texture and structural integrity. The controlled heating process of melting at 75°C and raising the up to not more than 105°C, plays a crucial role in reducing moisture content and holding the gelling properties of the gelatin. This not only provides the characteristic chewiness associated with gummies but also contributes significantly to improved shelf stability by minimizing the risk of microbial growth.

The inclusion of citric acid serves multiple functional purposes. It enhances the taste profile by imparting a pleasant tanginess, balances the sweetness of sugars, and also acts as a preservative by lowering the pH of the formulation. Together, these factors improve both the sensory acceptability and the stability of the final product. (7)

Importantly, the formulation is designed to retain the core therapeutic benefits of the original *Drakshadileha* preparation. The herbal ingredients are known for their hematinic (blood-enhancing) and antioxidant properties, which may be beneficial in the management of iron deficiency anemia. By preserving these properties in a novel dosage form, the formulation maintains its clinical relevance.

Gummies are more palatable, easy to consume, and particularly appealing to populations such as children and the elderly, who may have difficulty with conventional dosage forms like decoctions or tablets.

Overall, this work highlights the promising potential of herbal gummies as a modern, patient-friendly delivery system for traditional medicines. However, to fully establish their efficacy, safety, and quality, further studies focusing on standardization, stability testing, and clinical validation are necessary.

CONCLUSION:

The key active constituents, such as the antioxidants and iron-supporting phytochemicals present in *Drakshadileha*, contribute to improving hemoglobin levels and overall health, supporting their role in the management of iron deficiency anemia. The formulation combines the benefits of these traditionally used herbs in a modern, palatable, and convenient dosage form.

The use of polyherbal oral gummies provides several advantages over conventional preparations. The ingredients are **easily available, time-tested in traditional medicine, and safe**, while the gummy dosage form enhances **patient compliance**, particularly among children and elderly populations. This study highlights the potential of **herbal gummies as a safe, effective, and patient-friendly approach for managing iron deficiency anemia**.

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