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Pharmaceutical Standardization of Nirgundi Guggulu

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Abstract

Ayurvedic medicines have witnessed a surge in global popularity for treating various ailments. The global focus is on the phytochemical and pharmacological analysis of herbal products. Guggulu (Commiphora wightii), a commonly used herbal drug, is renowned for its anti-inflammatory, anti-hyperlipidemic, and cardio-protective properties. Among various Guggulu formulations, Nirgundi Guggulu, a notable formulation described in "Rasendra Sara Sangraha" Vata Roga chapter, is indicated for treating Vata Roga, Sannipataj Roga, and Mandal Kustha. Its ingredients, Shuddha Guggulu (Commiphora wightii) and Nirgundi root (Vitex negundo), undergo pharmaceutical procedures such as Shodhana and Vati preparations, aligning with the methods mentioned in Rasendra Sara Sangaha. However, no research has been conducted to standardize the preparation method of Nirgundi Guggulu as per classical Ayurvedic literature guidelines. The present study aims to address this by standardizing the Nirgundi Guggulu preparation process in line with classical Ayurvedic texts, ensuring consistency and quality for treatment purposes.

Keywords

Nirgundi Guggulu, Vataroga, Shodhana

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1. Introduction

Ayurveda recognizes the therapeutic potential of natural metals, minerals, and plants, but their raw forms can be toxic or poorly absorbed by the body. In Ayurvedic pharmaceutical disciplines like Rasa Shastra and Bhaishajya Kalpana, specific techniques like purification and incineration are used to transform these substances into safe and potent therapeutic forms. Ayurvedic preparations with Herbal and/or minerals origin, effectively treat a wide range of health conditions and are valued for their small dosage, rapid action, palatability, and extended shelf life [1]. This traditional knowledge ensures their safe and effective use in Ayurvedic treatments, enhancing their bioavailability and therapeutic properties to promote health and well-being. Traditional/Ayurvedic medicines are gaining increasing popularity worldwide for the treatment of various diseases in recent times. Even there is a growing interest in research on Ayurvedic science. One among the many drugs used in preparation of medicines to cure disease is guggulu. This is considered to be the exudate of plant Commiphara wightii. It is also popularly known as Indian bellidium, and it is found in northern parts of India, Bangladesh and Pakistan. The Sanskrit meaning of the word guggulu is “one that protects against disease”. Guggulu has been used in treating many kinds of diseases and it has a wide range of action when compared to other drugs, the main action being to lower the cholesterol and triglycerides level and in treating joint diseases.

Nirgundi Guggulu is a traditional Ayurvedic formulation mentioned in the Rasendra Sara Sangraha. It consists of equal parts of Suddha Guggulu (Commiphora wightii) and Nirgundi root powder (Vitex negundo) [2]. The preparation of Nirgundi Guggulu involves specific pharmaceutical procedures, including the purification of Guggulu, the preparation of Nirgundi root powder, and the creation of Vati (tablets) of Nirgundi Guggulu. Standardization of Ayurvedic drugs is crucial at various stages, from the selection and collection of raw materials to the final product, to ensure the safety and efficacy of the drug. In this study, the authors highlight the importance of these pharmaceutical procedures and aim to standardize the method for preparing Nirgundi Guggulu. This standardization process helps maintain the quality and consistency of the Ayurvedic formulation, ensuring that it can be used safely and effectively for therapeutic purposes.

1.1. Aims and Objectives

Pharmaceutical standardization of various steps involved in the preparation of Nirgundi Guggulu.

2. Materials and Methods

2.1. Chief References

Rasendra Sara Sangraha, Gopalkrishna sankalit, Ambikadatt Shastri, Gudharth-sandipika vyakhyopet, Vatvyadhichikitsa (slok no. 29-30), Chaukhambha Orientalia, Varanasi, Page- 371, 1994.

The complete preparation of Nirgundi Guggulu was conducted at the Department of Rasa Shastra and Bhaishajya Kalpana in Gomantak Ayurveda Mahavidyalaya and Research Centre, located in Shiroda, Goa. The pharmaceutical study was conducted in five different phases.

- Preparation of Nirgundi root Churna.
- Preparation of Triphala Kwath Churna (Yavakut).
- Preparation of Triphala Kwath.
- Shodhana of Guggulu.
- Preparation of Nirgundi Guggulu vati samples.

2.2. Nirgundi Guggulu Preparation

2.2.1. Materials

- Shuddha Guggulu, 1 Part
- Nirgundi Root Powder, 1 Part
- Cow Ghrita – Q.S

2.2.2. Method/Principle

- Shodhana, Churna Nirmana, Mardana

2.2.3. Apparatus

- Ulukhal Yantra, Gas Stove, Steel Vessel, Cloth, Spoon, Steel Vessel, Tray, Weighing Machine, Sieve.

2.2.4. Procedure

The preparation of Nirgundi Guggulu involved several pharmaceutical processes, including Shodhana, Churna Nirmana, Kuttana, Paristravana, and Vati preparation. In accordance with Rasendra Sara Sangraha, Triphala kwath is employed for the Shodhana of Guggulu. Therefore, Triphala was chosen as the medium for Shodhana in this study. The process began with the preparation of Nirgundi root powder. Subsequently, Triphala yavakut churna was prepared, followed by preparation of Triphala kwath[3]; it was used as media for the Shodhana of Guggulu.

Guggulu Shodhana was carried out using the paristravana method as mentioned in Rasendra Sara Sangraha[4]. During this process, Guggulu was dissolved in Triphala kwath, filtered after complete dissolution, and then boiled again until it exhibited Guggulu paka lakshana, maintaining a temperature between 70oC to 80oC[5] throughout the entire procedure. The purified Guggulu was then dried in sunlight.

Subsequently, equal quantities of Shuddha Guggulu and Nirgundi Root Powder were placed in an Ulukhal Yantra, and a sufficient amount of Cow Ghrita was added. The Kuttana process was carried out to create a homogenous mixture. This mixture was then shaped into 250mg Vati using the thumb and index finger. These Vati were dried in the shade and then stored in an airtight container for preservation.

2.2.5. Observation

- The Nirgundi root color during extraction was dark brown, transforming to a brownish hue upon drying. After repeated pounding and sieving, a small residue remained, consisting of coarse powder, which was then discarded.
- Triphala kwath churna softened when soaked overnight. Boiling water with Triphala kwath churna occurred between 80°C and 90°C[6], with initial frothing observed. After 3 hours and 40 minutes of heating, the water reduced to 1/4th its original quantity, resulting in a dark brown kwath. The characteristic smell of Triphala was evident, and the Triphala test was positive in the water.
- During process of Guggulu Shodhana, throughout the boiling process, a combined scent of Triphala kwath and Guggulu was noticed. Dissolving Guggulu in Triphala kwath resulted in a creamy brown solution. Complete dissolution of Guggulu took 3.5 hours, forming a thick and sticky consistency.
- During the boiling of the filtrate, the temperature was maintained between 70°C to 80°C[7] steady temperatures. Continuous stirring was essential.
- The final product observed was a dark brown, semi-solid mass. Guggulu adhered to the spoon during the paka stage, and fingerprints could be impressed onto the paka material after completion.
- During preparation of Vati, Mixing of Churna in Guggulu was found difficult. Colour of mixture was dark brown and having pleasant smell.

2.2.6. Precautions

- Kuttana should be carried out slow and steady to prevent spillage of the material.
- Pills are to be preserved in absolute sterile and moisture free air tight container.

3. Results and Discussion

Table 1. Showing the change in weight of various practices in the preparation of Nirgundi Guggulu.

Name of Practical	Initial Weight (g)	Final Weight (g)
Nirgundi Root	1866	1579
Triphala Yavakut	3600	3450

Table 2. Guggulu Shodhana Three Batches

Batch	Before Shodhana (g)	After Shodhana (g)
GS – 1	300	221
GS – 2	300	238
GS – 3	300	235

GS (Guggulu Shodhana)

Table 3. Nirgundi Guggulu three Batches

Batch	Nirgundi root powder (g)	Shuddha Guggulu (g)	Total Mixture (g)	Loss (g)
NG – 1	221	221	442	52
NG – 2	238	238	476	43
NG – 3	235	235	470	48

NG (Nirgundi Guggulu)

3.1. Discussion

3.1.1. Nirgundi Root Churna

In the preparation of Nirgundi Root Powder, the initial step involved drying the roots in sunlight for 8 days, resulting in a 4.5% loss. This loss indicated the presence of moisture content in the Nirgundi roots. After the drying phase, pounding was conducted, during which there was an 11.39% loss of material. This loss occurred due to some material spilling out during pounding and the retention of coarse powder after sieving.

3.1.2. Triphala Yavakut Churna

In the preparation of Triphala Yavakut powder, equal amounts of the pericarps of Haritaki, Bibhitaki, and Amalaki fruits were used. These three components were individually pounded because they have different hardness levels. Mixing them before pounding would result in an uneven mixture. Therefore, after pounding and sieving each separately, the mixing process was carried out to achieve a uniform blend. During the pounding process, there were observed losses of 5.66% for Haritaki, 3.33% for Bibhitaki, and 4.16% for Amalaki. These losses were attributed to material spilling out and the generation of fine powdered particles during the pounding.

3.1.3. Triphala Kwath

To prepare Triphala kwath, 1 kg of Yavakut Churna was combined with 8 liters of water and boiled until the volume reduced to one-fourth of the original. According to Acharya Sharangadhara, this proportion was chosen because Triphala falls under the "mrudu dravya" category. The boiling times for three separate batches were 220 minutes, 224 minutes, and 227 minutes, yielding 2100 ml, 2050 ml, and 1990 ml, respectively.

3.1.4. Guggulu Shodhana

Three batches of Guggulu Shodhana were carried out. The first batch required 5.5 hours of heating and 22 hours of drying in sunlight, resulting in a yield of 221 g from an initial 300 g, which is a loss of 26.33%. Both the second and third batches had the same heating and drying times, yielding 238 g (a 20.66% loss) and 235 g (a 21.66% loss), respectively. The average loss across all three batches of Guggulu Shodhana was 22.89%. The loss observed in this process is attributed to a portion of the Guggulu sticking to the vessel and some of it spilling during the processing.

3.1.5. Nirgundi Guggulu

Shodhita Guggulu was placed in an Ulukhal Yantra and pounded while adding Go Ghrita until it reached a waxy consistency. Subsequently, equal amounts of Shuddha Guggulu and Nirgundi root powder were combined in the Ulukhal Yantra, and a small quantity of Go Ghrita was added to facilitate the Kuttana process. In the first batch, 221 g each of Shuddha Guggulu and Nirgundi root Churna were used. In the second batch, 238 g each of Shuddha Guggulu and Nirgundi root Churna were em-

ployed, and in the third batch, 235 g each of Shuddha Guggulu and Nirgundi root Churna were utilized. The observed losses in these batches were 52 g, 43 g and 48 g, respectively. These losses occurred during the Kuttana process, during the transfer of materials, and during the Vati making process.

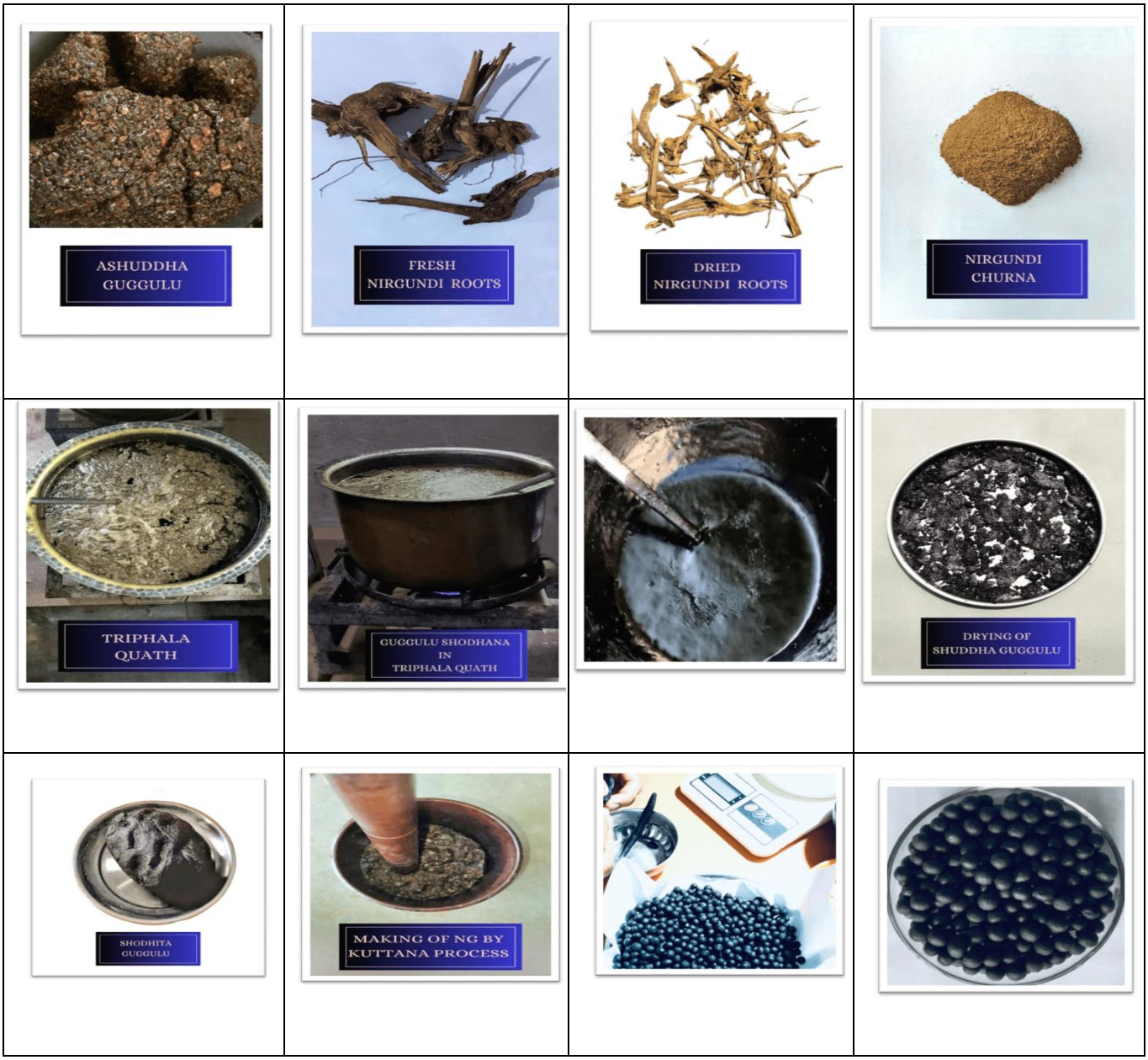

Figure 1. Preparation of Nirgundi Guggulu

4. Conclusions and Future Scope

The pharmaceutical standardization of Ayurvedic formulations is crucial to establish their efficacy and consistent biological activity. This study involves various pharmaceutical procedures, including Kwath preparation, Shodhana, Churna Nirmana,

Kuttana, and the preparation of Vati for Nirgundi Guggulu. Shodhana is particularly vital in eliminating the toxic nature of ingredients and enhancing therapeutic efficacy, ensuring the formulation is safe and effective.

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