A PHARMACEUTICO-ANALYTICAL STUDY OF AMRITADYA GUGGULU
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ABSTRACT
Aushadha Kalpana is prepared by different pharmaceutical processing applied to the crude drugs to get the desired therapeutic effects. Guggulu kalpana is one of them. Guggulu is the gummy resin of the Indian plant bdellium i.e. Commiphora mukul. Guggulu is always used after Shodhana to remove its impurities. So the process of Shodhana becomes imperative in different media. In addition to it, Shodhana of Guggulu in different media brings specific properties to Guggulu. Ayurvedic medicines are gaining increase in popularity worldwide for the treatment of various diseases in recent times. In the present study, Amritadya guggulu, one of the Guggulu preparation mentioned in Pidika, Bhagandara and Sthaulya like conditions in Chakkradatta, was prepared and analysed so as to prove the safety and efficacy of the drug. Aims and objectives: To develop standard operative procedure for preparation of genuine drug and to analyze the safety and purity of the drug. Material and Methods: Amritadya guggulu was prepared as per classical texts and analysed by using different parameters like organoleptic properties, physicochemical properties, TLC etc. Discussion and Conclusion: 50% weight loss was observed. The weight loss was due to removal of impurities present in the Guggulu and handling loss. Presence of low acid insoluble ash (1.08%) determines the presence of low adherent dirt as well as sand particles. Presence of low moisture content (loss on drying 6.2%) decreases decomposition and enhances the shelf life and therapeutic value of the drug. Hence it can be concluded that the pharmaceutical and analytical study confirm the authenticity and quality of the drug.

INTRODUCTION
Guggulu kalpana comes under Vati kalpana[1] where herbal drugs are mixed with Guggulu in the powder form. Guggulu is an amorphous translucent, solid adhesive, oleo-gum-resin produced by the process of gummosis from its plant. Many properties of Guggulu are described in our classics. Acharya Charaka included Guggulu in Sangya Sthapana Mahakashaya[2] and in “Kashaya Skandha”[3], Maharishi Sushruta has described Guggulu in the list of seven most important drugs for the treatment of Sthaulya[4]. He has prescribed Guggulu with Go-Mutra in condition of vitiated Vata with Medodhatu dominated Kapha dosha.[5] Amritadya guggulu is a well known drug of Ayurveda. Acharya Chakkradatta has explained Amritadya guggulu in Medo Roga chikitsa[6]. To make Guggulu fit for internal use, it has to undergo the process of Shodhana, which is done to remove the impurities as well as to increase the therapeutic properties. Guggulu kalpana can be prepared by making Paka (heating) as well as without Paka (hammering) method. It is essential to standardize the drug and examine the quality and safety of the drug. Therefore an attempt was made in the present study to establish standard operative procedure for preparation of Amritadya Guggulu. “Without Paka”[7] method was used for preparation of Guggulu. Success of pharmaceutical study can be...
confirmed through assessing effectiveness in clinical study as well as results of analytical study. Analytical study provides idea about quality and safety of finished product. Without analytical study of the drug, the research related to medicinal field is incomplete. So for that purpose some analytical tests were performed and their results were compared with standard parameters.

**MATERIAL AND METHODS**

**Pharmaceutical Processing of Amritadya Guggulu**

It was done in four steps
1. Preparation of Trifala Kwatha
2. Guggulu Shodhana
3. Powdering of the other ingredients of Amritadya Guggulu
4. Pounding of Shudha Guggulu with the powder of rest of the ingredients.

**Preparation of Trifala Kwatha**

Fruit pericarp of Amalaki, Haritaki and Bibhitaka (200g each) were taken. They were screened, washed, dried properly and crushed into coarse powder. Then 4.8L of water was added to them in a SS vessel and kept overnight, opting general rules of making decoction. Next day, decoction was prepared by heating and reducing the material to 1.2L (1/4th of its original volume). The decoction was then filtered and kept in a stainless steel vessel for Guggulu Shodhana.

**Guggulu Shodhana**

All the physical impurities in the Ashuddha Guggulu like stone, wood, bark particles etc., were picked up manually. It was then broken into small pieces. Then it was bundled in a piece of cotton cloth and kept in Dola Yantra containing Trifala Kwatha and allowed to stand for 2-3 hours on low flame. Then it was macerated well with ladle. When most of Guggulu was dissolved into Trifala Kwatha, bundle of cotton cloth was put outside the Kwatha and residue in cloth was discarded. Now the liquid was heated on LPG Stove on low flame with continuous stirring. As water got evaporated, its consistency increased gradually. When it started to become Ghana (Avalehavata), the vessel was transferred on water bath to avoid the burning of Guggulu at the bottom of vessel. Then the Guggulu was put in the Ghrita smeared tray and it was kept in sunlight for drying. After drying, it was put out of the tray and stored in an air tight plastic.

**Powdering of the other ingredients of Amritadya Guggulu**

| Sr. No. | Name         | Botanical name        | Family      | Part Used | Proportion |
|---------|--------------|-----------------------|-------------|-----------|------------|
| 1       | Guduchi      | Tinospera cordifolia  | Menispermaceae | Stem      | 1 part     |
| 2       | Ela          | Elettaria cardamomum  | Zingiberaceae | Seeds     | 2 parts    |
| 3       | Vidanga      | Embelia ribes         | Myrcinaceae  | Fruit     | 3 parts    |
| 4       | Kutaja       | Holarrhena antidysenterica | Apocynaceae | Bark      | 4 parts    |
| 5       | Bibhitaka    | Terminalia belerica   | Combretaceae | Fruit Pericarp | 5 parts |
| 6       | Amalaki      | Emblica officinalis    | Euphorbiaceae | Fruit Pericarp | 6 parts |
| 7       | Haritaki     | Terminalia chebula    | Combretaceae | Fruit Pericarp | 7 parts |
| 8       | Shudha Guggulu | Commifora mukul     | Burseraceae | Exudates | 8 parts    |

1. The herbal ingredients of Amritadya Guggulu were screened for physical impurities like stone, wood, bark particles or any other foreign particle.
2. After that, each ingredient was separately washed with R.O. water and dried in direct sunlight.
3. After proper drying, each ingredient was separately grinded in the grinding machine and passed through Sieve No. 85.
4. Then the required amount of the powder of each ingredient was taken in SS tray and mixed uniformly.
5. This mixture of drugs was retained for the further processing.

**Pounding of Shudha Guggulu with the powder of rest of the ingredients**

1. A weighed amount of Shuddha Guggulu (i.e. 112g) was taken in a Mortar.
2. It was crushed into small pieces with the help of pestle.
3. Then a small amount of R.O. water was sprinkled over Guggulu and pounding was done with help of pestle.
4. After that, a small amount of mixture of herbal drugs was sprinkled over Guggulu and pounding was continued.
5. In the same way, all the mixture of herbal drugs was mixed with Guggulu with continuous pounding.
6. A little amount of Go-ghrita was also added during pounding.

7. When approximate 1.25 Lac pounding was completed, then the whole mass was broken into small pieces and put into SS Tray.
8. This tray was kept into Hot air oven at 35-40°C temperature for about 8 hrs.
9. After proper drying of mass, granulation was done.

These obtained black granules of Amritadya guggulu were stored in air tight container

**Guggulu Shodhana**

![Guggulu Shodhana](image)

**Ashudha Guggulu Shodhana in Trifala Kwatha Shudha Guggulu**

**Amritadya Guggulu Preparation**

![Amritadya Guggulu Preparation](image)

Powder of other ingredients pounding of Guggulu with Amritadya guggulu granules powdered ingredients

**Observations and Results**

| Volume | Colour     | Taste    | Smell      | pH |
|--------|------------|----------|------------|----|
| 1.2 L  | Dark brown | Astringent| Characteristic | 3  |

**Table 2: Observations of Trifala Kwatha**

**Table 3: Result of Guggulu Shodhana**

| Shudha guggulu obtained | Weight loss | Colour         | Taste   | Odour          |
|-------------------------|-------------|----------------|---------|----------------|
| 250g                    | 50%         | Brownish black | Bitter  | Characteristic |

**Table 4: Quantitative Changes during the Processing of Herbal Drugs**

| Sr. No. | Name of the drug | Wt of Drug taken | Wt of drug after screening, washing and drying | Wt after grinding and sieving | Wt loss |
|---------|------------------|------------------|-----------------------------------------------|------------------------------|---------|
| 1.      | *Guduchi*        | 250gm            | 90gm                                          | 50gm                         | 40gm    |
| 2.      | *Ela*            | 240gm            | 240gm                                         | 168gm                        | 72gm    |
| 3.      | *Vidanga*        | 100gm            | 90gm                                          | 66gm                         | 24gm    |
| 4.      | *Kutaj*          | 100gm            | 70gm                                          | 60gm                         | 10gm    |
| 5.      | *Bibhitaka*      | 150gm            | 100gm                                         | 82gm                         | 18gm    |
| 6.      | *Amalaki*        | 200gm            | 120gm                                         | 90gm                         | 30gm    |
| 7.      | *Haritaki*       | 200gm            | 130gm                                         | 100gm                        | 30gm    |
Table 5: Amount of ingredients taken for the preparation of *Amritadya Guggulu*

| Sr.No. | Name     | Amount taken |
|--------|----------|--------------|
| 1.     | Guduchi  | 14gm         |
| 2.     | Laghu Ela| 28gm         |
| 3.     | Vidanga  | 42gm         |
| 4.     | Kutaja   | 56gm         |
| 5.     | Bibhitaka| 70gm         |
| 6.     | Amalaki  | 84gm         |
| 7.     | Haritaki | 98gm         |
| 8.     | Shudha Guggulu | 112gm |

Table 6: Result of Prepared *Amritadya Guggulu*

| End Product         | Amritadya guggulu |
|---------------------|-------------------|
| Weight              | 450g              |
| Colour              | Brownish black    |
| Odour               | Characteristic aromatic odour |
| Taste               | Bitter            |

Analytical Study of *Amritadya Guggulu*

Analysis of prepared *Amritadya Guggulu* was done at D.T.L.RIISM Joginder nagar on the basis of following two evaluation parameters:

1. Macroscopic analysis
2. Physico-chemical analysis

Table 7: Result of Macroscopic Analysis of *Amritadya Guggulu*

| S.No. | Parameters    | Result                  |
|-------|---------------|-------------------------|
| 1.    | Appearance    | Powder                  |
| 2.    | Colour        | Black                   |
| 3.    | Odour         | Characteristic          |
| 4.    | Taste         | Astrigent, Bitter and Pungent |
| 5.    | pH            | 3.40                    |

Table 8: Result of Physico-Chemical Analysis of *Amritadya Guggulu*

| S.No. | Parameters                              | Results               |
|-------|-----------------------------------------|-----------------------|
| 1.    | Loss on drying\[^10\]                   | 06.12 percent         |
| 2.    | Total Solids                            | 93.88 percent         |
| 3.    | Total Ash\[^11\]                        | 06.03 percent         |
| 4.    | Acid Insoluble Ash\[^12\]               | 01.08 percent         |
| 5.    | Water Soluble Extractive\[^13\]         | 38.23 percent         |
| 6.    | Methanol Soluble Extractive\[^14\]      | 29.48 percent         |
| 7.    | Identification Test                     | Positive test for Tannins |
| 8.    | Thin Layer Chromatography\[^15\]        | Showed the presence of Vidanga, Laghu ela, Guggulu, Kutaja, Guduchi, Haritaki, Bibhitaka, Amlaki |

(Analytical Report no. 1: Showing the Analysis of *Amritadya Guggulu* with Protocols of Test Applied as per ASU Pharmacopoeia/other specific Standards done at D.T.L.RIISM Jogindernagar)
DISCUSSION

250gm of *Shudha Guggulu* was obtained. 50% weight loss was observed. The weight loss was due to removal of impurities present in the *Guggulu* and handling loss. Total 616gm of powder was obtained from 1240gm of raw herbal ingredients. The observed weight loss was due to removal of impurities by screening, washing, drying and because of removal of roughage after powdering. Total outcome of *Amritadya Guggulu* preparation was 450gm from total 504gm of material taken. The loss in weight was due to evaporation of water content and handling loss during pounding process. A little amount of Go-ghrita was also added during pounding. The purpose of addition of Go-ghrita is that it may help to avoid the stickiness of *Guggulu* with the container during hammering. The result of analysis of *Amritadya Guggulu* showed that it was black in colour having characteristic odour and bitter in taste. The values of moisture content, total solids, total ash, acid insoluble ash, water soluble extractive and methanol soluble extractive were as per standards of API. The identification test was positive for Tannins. Thin layer chromatography showed the presence of Guduchi, Guggulu, Kutaja, Vidanga, Laghu ela, Amlaki, Haritaki and Bibhitaka. Presence of low acid insoluble ash (1.08%) determines the presence of low adherent dirt as well as sand particles. Presence of low moisture content (loss on drying 6.2%) decreases decomposition and enhances the shelf life and therapeutic value of the drug.

CONCLUSION

So with the present study it can be concluded that the pharmaceutical and analytical study confirm the authenticity and quality of the drug and can be used as reference standard for further studies.

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