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COMPARATIVE PHARMACEUTICO ANALYTICAL STUDY OF *DASHANG GUGGUL* PREPAREDBY *GUGGUL* PURIFIED IN TWO DIFFERENT MEDIA

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ABSTRACT

In present era Ayurvedic pharmaceutical industry spreading worldwide. Demand of Ayurvedic drugs is increasing day by day. The Ayurvedic drugs which are useful in the diseases related with joints, skin, hair, heart and digestion are more in demand. Today's change in lifestyle, resistance to new molecule of modern drugs and pandemic situation are important causes for the creating demand of the Alternate system ofmedicine.[1] Life style diseases like diabetes, obesity, cardiac disorders etc are becoming very common now a days. Obesity and atherosclerosis are mainly caused by disturbance in lipid metabolism. This can be corelate with Medo dhatu *dushti* as per ayurvedic pathogenesis.[2] *Dashang Guggul* is one of the very importance polyherbal formulation mentioned in the classical treaties of Ayurveda.[3] This formulation is commonly used in *medo dhatu dushti janya vikara*. *Guggul* is chief component of this formulation. *Guggul* (Commiphora wightii) is a oleo-gum or the resin part of *guggul* plant obtained from its stem. Nevertheless, the usage of thiswithout subjecting to *shodhana* (detoxification process) may lead to certain side effects like gastric irritation and gastric distress.[4] So the *Guggul shodhana* plays an important role in pharmaceutical preparation of any *Guggul Kalpana*. In addition to it, *shodhana* of *guggul* in different media will bring specific properties to *Guggul*.[5] In present study *Dashang Guggul* is prepared in two batches. *Guggul* used in both batches is purified in two different media e.g. *Triphala Kashaya* and *Dashmool kashay*. After pharmaceutical preparation of both*Guggul*, analytical study is carried out for comparative analysis.

INTRODUCTION

Guggul Kalpana one of the leading preparations in Ayurvedic Pharmaceutical industry. It is widely used by physician in various ailment. Arthritis, skin diseases and obesity are very common which is treated by various *Guggul* Preparations. Some known *Guggul kalpas* are *Yograj Guggulu, Lakshadi Guggulu, Kaishor Guggulu* ect. *Guggulu* is the chief ingredient of all *Guggul Kalpas. Guggul* is an exudate obtained in form of oleoresin gum from plant stem of Commiphera mukul (Hook ex. Stocks). Engl. belonging to family Burseraceae. It is known to have antiarthritic, anti-inflammatory and Anticholesterolemic properties.[6] *Dashang Guggul* is one of the important *Guggul Kalpa* used for *medoroga* (obesity)[7] It is also similar with *Navak Guggul*,[8] and *Vyoshadi Guggul*,[9] mentioned in Ayurvedic literature. *Guggul shodhan* is important procedure before using it for the formulation. As per ancient ayurvedic treaties there are so many medias are used for *Guggul shodhan*. Therapeutic properties may alter according to media used for the *shodhan*.

AIMS AND OBJECTIVE

1. Pharmaceutical preparation of two batches of *Dashang Guggul* by using *triphala kashay shodhit Guggul.*[10] *and Dashamool kashay shodhit Guggul.*[11]
2. Comparative physico chemical analysis of both *Dashang Guggul.*

MATERIALS

Pharmacy of *Rasashastra* and *Bhaishajya Kalpana* Department Gopabandhu Ayurveda College Puri is working place for preparation of *Dashang Guggul*. Raw material was collected from authentic sourceand verified by *Dravyaguna* Department of GAM Puri. Physico chemical analysis was carried out in the certified laboratory.

Methods

1. *Shodhan* of Raw *Guggul* by *Trifala Kashaya* and *Dashmool Kashaya* separately.
2. Pharmaceutical Processing of *Dashang Guggul* in two batches.
3. Physicochemical analysis of Raw *Guggul, Dashang Guggul* (TRF) and *Dashang Guggul* (DSML).

1. *Shodhan* of *Guggul*: *Trifala Kashaya* and *Dashamool Kashaya* is used for the *Guggul shodhan* separately. Method used for *Guggul shodhan* is *Swedana* by *Dola yantra*. For preparation of *Trifala Kashaya*, 500 gm each *Yavakuta Churna* of *Haritaki, Vibhitaki, Amalaki* were taken. *Trifala yavakuta churna* was soaked overnight in 24 litres of water. Next morning it was subjected to heat on mild temperature (between 75^0 - 85^0C) and water reduced to 3 litre approx. Same procedure is followed for the *Dashamool Kashaya* preparation. Total 1500 gm *Dashmool yavkuta Churna* was taken and prepared *Dashamool Kashaya* was 3 litres approx.[12]

Raw *Guggul* was divided into two batches for *Shodhana* procedure in *Trifala* and *Dashamool Kashaya* separately. In each group 500 gm *Guggul* was taken. Before that external physical impurities like stone, bark, wood etc. from raw *Guggul* were removed manually. Raw *Guggul* was made into small pieces. It was kept in a cotton cloth and tied properly to made a *Pottali*. For both batches separate *Pottali* were prepared. Both *Pottalis* were taken in a steel container filled with *Kashaya* separately (2 litres in each container). These *Pottalis* were tied like pendulum manner in separate container to form *Dola Yantra*.[13] Both *Dola Yantras* were subjected to heat. Temperature was maintained between 85^0 –105^0C. When most of the *Guggul* dissolves in *Kashaya* and residue remains in the *Pottali*, heating was stopped and *Pottali* was separated from the container. *Guggul* dissolved *Kashaya* was again kept on mild heat to evaporate the water content and it was converted into semi solid mass. This semisolid mass was put in the *Ghrit* smeared tray and it was kept for drying. This dried form *Shuddha Guggul*. It was obtained 607 gm by *Trifala Kashaya* and 375 gm by *Dashmool Kashaya*. Weight gain was noticed in *Trifala Kashaya shodhit Guggul*.

2. Preparation of *Dashang Guggul*: Two batches were prepared. Quantity taken in the preparation are as follows

Table 1: DG (TRF) – Batch One.

Sr. No.	Name of the Ingredient	Botanical Name	Family	Part Used	Quantity taken
1.	*Guggul Trifala Shodhit*	Commiforamukul	Burseraceae	Exudates	270 gm
2.	*Haritaki*	Terminaliachebula	Combretacease	Fruit Pericarp	30 gm
3.	*Vibhitaki*	Terminaliabelerica	Combretaceae	Fruit Pericarp	30 gm
4.	*Amalki*	Emblica officinalis	Euphorbiaceae	Fruit Pericarp	30 gm
5.	*Shunthi*	Zingiber officinale	zingibareceae	Rhizom	30 gm
6.	*Pippali*	Piper longum	Piperaceae	Fruit	30 gm
7.	*Marich*	Piper nigrum	Piperaceae	Fruit	30 gm
8.	*Vidang*	Embelia ribes	Myrcinaceaee	Fruit	30 gm
9.	*Nagarmotha*	Cyperusrotundus	Cyperaceae	Roots	30 gm
10.	*Chitrakmool*	Plumbagozeylanica	Plumbaginaceae	Roots	30 gm

Table 2: DG (DSML) – Batch Two.

Sr. No.	Name of the Ingredient	Botanical Name	Family	Part Used	Quantity taken
1.	*Guggul Trifala Shodhit*	Commiforamukul	Burseraceae	Exudates	270 gm
2.	*Haritaki*	Terminaliachebula	Combretacease	Fruit Pericarp	30 gm
3.	*Vibhitaki*	Terminaliabelerica	Combretaceae	Fruit Pericarp	30 gm
4.	*Amalki*	Emblica officinalis	Euphorbiaceae	Fruit Pericarp	30 gm
5.	*Shunthi*	Zingiber officinale	zingibareceae	Rhizom	30 gm
6.	*Pippali*	Piper longum	Piperaceae	Fruit	30 gm
7.	*Marich*	Piper nigrum	Piperaceae	Fruit	30 gm
8.	*Vidang*	Embelia ribes	Myrcinaceaee	Fruit	30 gm
9.	*Nagarmotha*	Cyperusrotundus	Cyperaceae	Roots	30 gm
10.	*Chitrakmool*	Plumbagozeylanica	Plumbaginaceae	Roots	30 gm

Following procedure was adopted to prepare *Dashang Guggul* in both batches

1. Properly dried and free from physical impurities ingredient no. 2 to 10 were taken and grinded in grinding machine and passed through sieve no 85.
2. 30 gm powder of each ingredient were mixed uniformly.
3. This Powder mixture of all ingredient was mixed uniformly in *Shodhit Guggul*. Firstly, manually mixing done then pounding apparatus was used.
4. All the mixture of herbal drugs was mixed with *Guggul* with continuous pounding.
5. A little amount of *Go-ghrit* was also added during pounding. When mixture become soft and homogenous pounding was stopped. Total 22 hours of pounding process were done.
6. Manually approx. 250 mg weighs pills were prepared.

Analytical Study of *Dashang Guggul* (both batches) Physico chemical analysis was performed as per the guideline of the API,[14] by certified Anacon laboratories

pvt. Ltd Butibori, Nagpur.

Table 3: Raw *Guggul* – Macroscopic Analysis.

S. N.	Parameter	Result
1.	Appearance	Powder, crystallin
2.	Colour	Brown,
3.	Odour	Characteristic
4.	Taste	Bitter, Pungent

Table 4: Raw *Guggul* – Physico Chemical Analytical Reports.

S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
1.	Loss on drying at 105^0C	g/100g	Wet classical method	7.63
2.	Total Ash Value	g/100g	Wet classical method	7.62
3.	Acid Insoluble Ash	g/100g	Wet classical method	1.465
4.	Foreign Matter	g/100g	Wet classical method	8.3
5.	Water Soluble Extractive	g/100g	Wet classical method	45.20
6.	Alcohol Soluble Extractive	g/100g	Wet classical method	41.93
7.	Volatile Oil	Ml/100g	Wet classical method	3.81
	Heavy Metals			
8.	Lead (as Pb)	mg/kg	ICP - OES	7.14
9.	Arsenic (as As)	mg/kg	AAS – Graphite	ND

Table 5: DG (TRF) – Macroscopic Analysis.

S. N.	Parameter	Result
1.	Appearance	Powder
2.	Colour	Black
3.	Odour	Characteristic
4.	Taste	Astringent, Bitter, Pungent

Table 6: DG (TRF) - Physico Chemical Analytical Reports.

S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
1.	Loss on drying at 105^0C	g/100g	Wet classical method	5.69
2.	Total Ash Value	g/100g	Wet classical method	7.13
3.	Acid Insoluble Ash	g/100g	Wet classical method	0.05
4.	pH (5%)		By pH meter	4.45 at 25^0C
5.	Water Soluble Extractive	g/100g	Wet classical method	73.14
6.	Alcohol Soluble Extractive	g/100g	Wet classical method	8.34
	Heavy Metals			
7.	Lead (as Pb)	mg/kg	ICP - OES	2.14
8.	Cadmium (as Cd)	mg/kg	ICP - OES	ND
9.	Mercury (as Hg)	mg/kg	AAS – VP	ND
10.	Arsenic (as As)	mg/kg	AAS – Graphite	ND
	Microbial contamination			
11.	Total bacterial count	cfu/g	IS 5402	<10
12.	Fungal count	cfu/g	IS 5403	<10

Table 7: DG (DSML) – Macroscopic Analysis.

S. N.	Parameter	Result
1.	Appearance	Powder
2.	Colour	Greyish Black
3.	Odour	Characteristic
4.	Taste	Bitter, Pungent

Table 8: DG (DSML) Analytical Reports.

S.N.	Test Parameter	Measurement Unit	Test Method	Test Result
1.	Loss on drying at 105^0C	g/100g	Wet classical method	6.24
2.	Total Ash Value	g/100g	Wet classical method	7.79
3.	Acid Insoluble Ash	g/100g	Wet classical method	0.03
4.	pH (5%)		By pH meter	3.62 at 25^0C
5.	Water Soluble Extractive	g/100g	Wet classical method	74.63
6.	Alcohol Soluble Extractive	g/100g	Wet classical method	10.44
	Heavy Metals			
7.	Lead (as Pb)	mg/kg or ppm	ICP - OES	4.24
8.	Cadmium (as Cd)	mg/kg or ppm	ICP - OES	ND
9.	Mercury (as Hg)	mg/kg or ppm	AAS – VP	ND
10.	Arsenic (as As)	mg/kg or ppm	AAS – Graphite	ND
	Microbial contamination			
11.	Total bacterial count	cfu/g	IS 5402	<10
12.	Fungal count	cfu/g	IS 5403	<10

OBSERVATION AND DISCUSSION

500 gm of Raw *Guggul* was taken for the *Shodhan* process in both media. During*swedana* by *Dola Yantra* most of the *Guggul* dissolved in the *Kashaya*. 26 gm and 31 gm residue were obtainedin the *Pottali* dipped in *Trifala* and *Dashmool Kashaya* respectively. After heating *Guggul* dissolved *Kashaya*, it was converted in semisolid form which appears like coal tar. 107 gm Weight gain was observed in *Trifala Kashaya shodhit Guggul* whether 125 gm loss was observed in *Dashmool Kashaya shodhit Guggul*. Gain may be due to concentration of *Trifala Kashaya* was more than *Dashamool Kashaya*. So, *Ghana satva* (water soluble extractive) of the *trifala* may increases weight of *Guggul*. *Trifala shodhit Dashang Guggul* has more pH value than Dashamool Shodhit.

Trifala shodhit Dashang Guggul has astringent taste predominantly, it might be due to increase percentage of *Trifala*. Loss on drying in both *Dashang Guggul* was observed between 5-6 gm%. Ash value of both *Dashang Guggul* were almost similar. It was also observed that Lead percentage in Raw *Guggul* was 7.14 ppm, whereasin *Trifala shodhit Dashang Guggul* had 2.14 ppm and *Dashamool shodhit Dashang Guggul* had 4.24 ppm. *Guggul shodhan* reduces Lead percentage in both batches. Other heavy metal component like Cadmium, Mercury and Arsenic was not detected. Bacterial and Fungal contamination was found less than 10 cfu/gm.

RESULT AND CONCLUSION

Trifala Kashaya shodhit Guggul gain its weight whereas *Dashmool Kashaya shodhit Guggul* loses. Apart from pH of *Dashang Guggul* all other physico chemical parameters are similar in both batches. pH of *Dashang Guggul* (DSML) is less than the pH of *Dashang Guggul* (TRF). Heavy metal components are reduced after *Guggul shodhana*. 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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