

ON IMPROVING THE DISINTEGRATION OF AYURVEDIC PILLS CONTAINING GUGGULU

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ABSTRACT: *An attempt is made in this communication to report a better way of preparing guggulu – containing pills. This technique improves the disintegration time of the preparation, thus enhancing its therapeutic value.*

INTRODUCTION

Guggulu is a very well known and important drug amongst all the ayurvedic physicians. It has very wide and frequent use in a variety of diseases of human beings as well as the animals. It is in use since Vedic period¹. There are various plant resins or roots² which are sold in market by the name of Guggulu but the oleogum resin in *Commiphora mukul*³ is the widely accepted guggulu which is a member of Burseraceae family. Guggulu has remained an important therapeutic agent in Ayurveda and has many a varied indication. It is effective in curing them because of its specific properties⁴ (*Rasa, Guna, Virya* and *Vipaka*) and also having in addition the *rasayana* quality⁵.

There are a large number of preparation in Ayurveda with guggulu as a major ingredient viz., Yogaraja Guggulu, Simhanada Guggulu, Tryodasanga Guggulu, Triphala Guggulu, Laksa Guggulu, Vatari Guggulu, Goksuradi Guggulu, etc. It has been reported that ayurvedic pills containing guggulu when taken orally, are passed

through the faecal matter as such without disintegrating in the gastro-intestinal tract. The result is that many ayurvedic pills containing guggulu are extremely unsatisfactory regarding their disintegration time. For this reason, it has become inevitable to find out the best method of pharmaceutical processing of guggulu pills to manufacture such pills which may get disintegrated quickly in the gastro – intestinal tract within the required period. With this objective the present work on guggulu pills was attempted.

For this purpose guggulu was processed pharmaceutically to obtain the following objectives :

1. Purification of guggulu resin by the various ayurvedic pharmaceutical processes as per standard texts.
2. Pharmaceutical processing of ayurvedic pills (containing guggulu as major ingredient) manually as well as the

machine using the different guggulu samples purified in different media.

3. Addition of some additives in the pills or tables to reduce their disintegration time.

MATERIALS AND METHODS

For purification of the crude guggulu resin, six different liquid media namely *Jala* (Distilled water), *Godugdha*⁶ (Cow's milk), decoction of *Triphala* (*Terminalia chebula*, *Terminalia bellirica*, *Embllica officinalis*) and *Guduchi*⁷ (*Tinospora cordifolia*); *Gomutra*⁸ (Cow's urine), decoction of *Vasa*⁹ (*Adhatoda vasica*) and the decoction of *Nirgundi*¹⁰ (*Vitex negundo*) have been adopted.

The crude guggulu resin (market sample) was boiled in the *Dola Yantra* (a special arrangement of apparatus as per ayurvedic text) on mild heat (60⁰C – 70⁰C) using the above stated liquid media one by one separately, till its complete dissolution. The supernatant part of the solution was then decanted to another pot leaving behind the impurities and evaporated to dryness.

With these six purified samples of guggulu, various types of pills were made. One batch of pills was containing only guggulu and other had some more different ingredients according to the classical compound preparations commonly used by the physicians. The pills were made manually by hammering the guggulu as per the ayurvedic classical pharamaceutics¹¹, by some modifications in processing and also by adding some suitable additives as disintegrating agents to get better or improved disintegration of the pills. For additives, ayurvedic substances like the specific herbal power of the major ingredient of particular compound preparation itself, or powder of *Dugdha*

Pasana (Talc) and Sodium bicarbonate are considered. Likewise the tablets of the same drug material have also been processed compressing the drug material, after granulation¹², into tablet form by means of a tablet machine which stamps out tablets in die between punches.

Thereafter, a critical comparative study was undertaken using a tablet disintegration machine (I.P. IIIrd edition 1985¹³) to record the disintegration time of pharmaceutically processed different pills or tablets. For this purpose, the disintegration test was carried out using an aqueous acid pepsin solution¹⁴ containing 0.3 w/v pepsin and 0.6% v/v hydrochloric acid. This solution was intended to stimulate the reaction of the gastric fluid. In this solution the tablets or pills were kept only for three hours continuously. If not disintegrated, they were transferred to an alkaline solution¹⁵ containing 0.3% pancreatin, 1.5% w/v bicarbonate of soda and 0.5% w/v sodium tauroglycocholate. This solution was intended to stimulate the reaction of the intestinal fluid. The pills or tablets should disintegrate within one hour in this fluid. The percentage of the disintegration of pills or tablets obtained within the particular period is then compared with other batches of the same pills and tablets.

RESULTS, DISCUSSION AND CONCLUSION

After purification of guggulu in six different liquid media, the pH of purified guggulu was found to be altered in each liquid separately and this pH results lastly on the disintegration of the pills or tablets.

Pills consisting of only purified guggulu did not disintegrate even after twenty hours either in acidic or alkaline liquid. Only the colouring matter of the media used for

purification could be slightly leaked in the solution but the pills remained as such. They were found to be swollen only with the moisture. Even the pills of guggulu having other constituents (classical compound preparations) processed after hammering, do not disintegrate at all. It is most probably due to the increased resinous nature and cohesiveness between the particles of the material. But when the same pills were processed without hammering, they gave better results. It may be due to the reduction in cohesive force between the particles of the material.

The tablets of the same drug material proved much better than their pills, when processed after the granulation. Again the tablets of the same drug material when processed with different additives, were found very much encouraging regarding their disintegration time. At many places, both acidic and alkaline medium have been used for the observation of the effect of the medium on the disintegration time of the drug. While using sodium bicarbonate as an additive for better disintegration, selection of medium (solvent) for disintegration is of importance because nature of the medium having the similar chemical nature as that of the

additive or neutral may enhance the disintegration of the drug than having of the opposite chemical nature because of the reaction taking place between medium and additive. *Dugdha – Pasana* powder (Talc – hydrated magnesium silicate containing small amount of aluminum silicate) is not actually a disintegrate but it promotes the disintegration by increasing the distance between the particles of the material, thus helping in disintegrating them easily. The composition of drug mixture which gave the best disintegration was as follows: guggulu powder – 1000g, talc – 100g and sodium bicarbonate – 100g. So it is hoped that if *Dugdha – Pasana* powder is added prior to the addition of the sodium bicarbonate in the pills or tablets, there will be further improvement in disintegration. Herbal powder used as an additive for better disintegration, may help either by increasing the distance between the particles of drug material itself or by their chemical nature of acidity or alkalinity. Thus, most encouraging disintegration effects within the time limit of 3 to 4 hours, were found after using different additives during the pharmaceutical processing of the pills or tablets.

TABLE 1 : The disintegration time of various ayurvedic pills containing Guggulu

S. No.	Name of the Sample (Pills)	Initial Weight	Final Weight	Liquid Media		Disintegration time		% of disintegration
				Acidic	Alkaline	Hours	Minutes	
1	Yogaraja Guggulu (Gomutra Sodhita + Dugdha Pasana)	218 mg	00	+	-	01	00	100.00
2	Simhanada Guggulu (Gomutra Sodhita + Sod. Bicarb)	220 mg	00	+	-	01	50	100.00
3	Tryodasanga Guggulu (Gomutra Sodhita + Triphala)	210 mg	00	+	-	01	05	100.00
4	Triphala Guggulu (Gomutra Sodhita + Triphala)	200 mg	00	+	-	01	00	100.00
5	Laksha Guggulu (Gomutra Sodhita + Dugdha Pasana)	206 mg	00	+	-	02	45	100.00
6	Vatari Guggulu (Vasa Kwatha Sodhita + Sod. Bicarb)	204 mg	00	+	-	00	30	100.00
7	Goksuradi Guggulu (Gomutra Sodhita + Triphala)	200 mg	00	+	-	00	10	100.00

TABLE 2 : The disintegration time of various ayurvedic pills containing Guggulu

S. No.	Name of the Sample (Pills)	Initial Weight	Final Weight	Liquid Media		Disintegration time		% of disintegration
				Acidic	Alkaline	Hours	Minutes	
1	Yogaraja Guggulu (Gomutra Sodhita + Sod. bicarb)	250 mg	00	+	-	00	10	100.00
2	Simhanada Guggulu (Nirgundi Sodhita + Sod. Bicarb)	250 mg	00	+	-	00	25	100.00
3	Tryodasanga Guggulu (Triphala Sodhita + Triphala)	250 mg	00	+	-	00	05	100.00
4	Triphala Guggulu (Gomutra Sodhita + Sod. Bicarb)	250 mg	00	+	-	00	15	100.00
5	Laksha Guggulu (Gomutra Sodhita + Sod. Bicarb)	250 mg	00	+	-	00	20	100.00
6	Vatari Guggulu (Gomutra Sodhita + Dugdha Pasana)	250 mg	00	+	-	00	15	100.00
7	Goksuradi Guggulu (Gomutra Sodhita + Dugdha Pasana)	250 mg	00	+	-	00	02	100.00

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