

## **Accelerated stability study of *ghanavati*, *kalpa*, and jelly prepared from *gomutra*.**

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### **Abstract:**

Ayurveda is a holistic medical science which deals with treating various diseases and also helps in preventing diseases. It uses various herbal-mineral origin *dravyas* to prepare formulations. It also uses various animal-origin *dravyas* for the preparation of formulations among which cow is the biggest contributor. Cow urine, milk, and feces are used the most. Cow urine is considered as ‘nectar of god’. It contains many components like sodium, potassium, magnesium, calcium, sulfur, urea, uric acid, and proteins. Cow urine’s stability decreases with time and also its palatability. Preparation of different dosage forms of *gomutra* was required. Formulations such as tablets, granules, and jelly were prepared and their stability study is done using Appearance, pH, specific gravity, color, odor and proteins were tested on day 0, 90 and 180 and results were compared with the stability of *gomutra*. Formulations were more stable in an accelerated study of six months.

**Keywords:** Ghanavati, Kalpa, Jelly,

*Gomutra*, Disptick method, Accelerated stability.

### **Introduction:**

Ayurveda is a holistic Indian science which deals with maintaining proper health and curing diseases of human beings.

Ayurveda deals with the body, mind, and soul of human beings and it helps in maintaining equilibrium between them.

Under Ayurveda, *Bhaishajya Kalpana* is one of the sub-branch which deals with the preparation of herbal formulations and various dosage forms required for the treatment of different diseases.

In earlier times holistic therapy was used by many Ayurvedic Acharya’s who were very close to nature.

This includes *dravyas* of herbal, metal, mineral, and animal origin which were used to prepare various formulations.

Products like a feather, urine, cow dung, milk, horns, shells, *nabhi* were used as animal products.

Among them, the major contributor to medicine is the cow.

Cow produce five different substances

which were used as medicine v.i.z., milk, ghee, cow dung, curd, and urine.

In ancient classical texts, different types of *mutras* were mentioned for treating various diseases.

In ancient classical texts, various *gunas* and *karmas* of each *mutra* were also described.

In ancient classical texts, a total of eight *mutras* are mentioned. They are *gomutra*, *ushtramutra*, *hastimutra*, *ajamutra*, *mahishamutra*, *vajimutra*, *kharamutra*, and *avimutra*.

Out of which *kharamutra*, *mahishmutra*, *ushtramutra*, and *vajimutra* should be taken from the male origin, and *gomutra*, *mahishmutra*, *avimutra*, and *ajamutra* should be taken from female origin.

Out of all these eight *mutras*, *gomutra* is considered to be the best.

Also whenever there is a description of only *mutra*, then always take *Gomutra* as a choice of *mutra*.

Various formulations are mentioned, in which *gomutra* is used as an ingredient or as *Bhavana dravya* in all *Samhita*.

In *Dammar tantra* use of *gomutra* as an internal medicine was mentioned for the first time.<sup>i</sup>

The biochemical estimation of cow urine has revealed that it contains sodium, nitrogen, sulphur, vitamin a, b, c, d, e, minerals, manganese, iron, silicon, chlorine, magnesium, citric, succinic, calcium salts, phosphoric acid, lactose, carbonic acid, enzymes, creatinine, and hormones. The contents of cow urine: water – 95%, urea – 2.5%, minerals, salts, hormones, enzymes – 2.5%.<sup>ii</sup>

Cow urine enhances the level of immunity by helping in synthesis of interleukin-1 and interleukin-2, augmenting b and t lymphocyte blastogenesis and IgA, IgM and IgG antibody titers.<sup>iii</sup>

It is very difficult for the patient to take *gomutra* as a whole because of its smell and taste.

Also, the dose of *gomutra* is very high for the patient to consume it as a whole.

Various *kalpanas* are widely used nowadays such as *gomutra haritaki*, *gomutra arka* to eliminate such issues but they may hamper the effect of *gomutra* if consumed as a whole.

To eliminate such errors, *gomutra* as a whole should be used.

Newer preparations such as *gomutra ghanvati*, *gomutra jelly*, and *gomutra Kalpa* are made.

The stability of the *Gomutra* reduces with time, color and odor change significantly with time which makes it difficult for the patient to consume.

The shelf life of *Gomutra* is also very less.

To eliminate such issues newer formulations were made and their stability study was done to assess stability and shelf life of dosage form.

For preparation of formulations three excipients are used they are,

**Agar-Agar:** Agar is in the form of transparent, odourless, tasteless strips or rough or fine powder. It may be slightly yellow-orange, yellowish grey to pale yellow, or colourless. Agar is tough when damp and brittle when dry.<sup>iv</sup>

**Sodium alginate:** Alginic acid is a white to yellowish fibrous powder, insipid, almost odorless.<sup>v</sup>

**Microcrystalline cellulose:** A partially depolymerised purified cellulose in the form of a white, odourless, tasteless and crystalline powder of porous particles. It is available on the market in different particle sizes and moisture levels which have different properties and applications.<sup>vi</sup>

**Aims and objectives:**

To study accelerated stability of *gomutra* and its formulations

### Materials and Methods:

Accelerated stability studies of these formulations were done for 6 months and inferences were noted.<sup>vii</sup> The stability of a pharmaceutical product is its capability in a specific container/ closure system to remain within its physical, chemical, microbiological, therapeutic, toxicological specifications. Throughout its shelf life.

### Assessment of stability using the following standard protocol:

Appearance, color, odor, pH, specific gravity,

### Instrument used:

Dipstick method for urinalysis

### Accelerated stability studies duration:

Initial, Third month, the Sixth month.

### Packaging and containers:

Testing was done using sterile and air-tight containers proposed for storage and distribution.

### Study conditions:

Samples	Conditions	Duration
Cow urine	40 <sup>0</sup> c +/-2 <sup>0</sup> c	6 months
Jelly	40 <sup>0</sup> c +/-2 <sup>0</sup> c	6 months
Ghanvati	40 <sup>0</sup> c +/-2 <sup>0</sup> c	6 months
Kalpa	40 <sup>0</sup> c +/-2 <sup>0</sup> c	6 months

### Preparation of *gomutra* jelly:<sup>viii</sup>

100 ml of *gomutra* was taken in an iron vessel

Measure 40 gms of sugar, 5 gms of agar-agar, and sodium alginate using a weighing scale

Ratio: 1:1:8:20::agar-agar:sodium alginate:sugar:*gomutra*

heat the vessel containing 100 ml of *Gomutra*

Add 40 gms sugar to it heat at 100<sup>0</sup>c, followed by adding agar-agar and sodium alginate in urine.

Stir it well till the spoon test is achieved.

Pour the jelly mixture into the mold.

let it cool at room temperature

Demold after 2 hours

Stored in a dry and labeled container

Duration: 30 mins

The yield obtained: 100 gms

yield %: 66.66%

### Preparation of *gomutra ghanavati*:<sup>ix</sup>

200ml of *gomutra* was taken in an iron vessel

Measure 2 gms of Micro Crystalline Cellulose using a weighing scale

Heat the vessel in low medium heat till it reaches 100<sup>0</sup>c

Stir it properly till it gets thicken

Remove from heat and add 2gms of methyl crystalline cellulose as per the weight obtained of ghana.

Make round tablets of 250 mg of it and coat it with MCC manually.

Store in a dry and labeled airtight container

### Preparation of *gomutra kalpa*:<sup>x</sup>

200 ml of *gomutra* was taken in an iron vessel measure 50 gms of sugar using a

weighing scale

Heat the vessel on low medium flame till it reaches 100°C

Add sugar then stir until it dissolves.

Heat the mixture till it becomes semi-solid.

Remove the mixture from heat and stir it continuously till it becomes granular.

Store the granules in a dry and labeled container.

Ratio: 1:4::sugar: *gomutra*

Duration: 60 mins

The yield obtained: 45 gms

yield %: 20%

### Preparation of soluble sample for analysis:<sup>xi</sup>

1 gm of *gomutra* jelly, Kalpa, and ghana

vati was taken in each test-tube

Add 1 ml of distilled water to each test tube and verify solubility.

Gradually 1 ml was added to each test tube till a clear solution was obtained in each test tube.

10ml of distilled water was added to each specimen to obtain the desired clear solution.

This solution was subjected to further analysis of stability study.<sup>1</sup>

### Observations:

Done using dipstick method used for urinalysis<sup>xii</sup>

Stability study on day 0

Parameters	<i>Gomutra</i>	<i>Gomutra</i> jelly	<i>Gomutra</i> ghanavati	<i>Gomutra</i> kalpa
Appearance	Liquid	Semisolid	Tablet	Granules
Color	Golden yellow	Yellow	Brownish-yellow	Brownish-yellow
Odour	Ammonic	Ammonic	Ammonic	Ammonic
Ph	8.2	9.6	8.5	9.4
Specific gravity	1.03	1.03	1.03	1.03
Proteins	Trace	Trace	Trace	Trace

Stability study on day 90

Parameters	<i>Gomutra</i>	<i>Gomutra</i> jelly	<i>Gomutra</i> ghanavati	<i>Gomutra</i> kalpa
Appearance	Liquid	Semisolid	Tablet	Granules
Color	Dark yellow	Yellow	Brownish-yellow	Brownish-yellow
Odour	Strong ammonic	Ammonic	Ammonic	Ammonic
Ph	8.4	9.6	8.6	9.6
Specific gravity	1.03	1.03	1.03	1.03
Proteins	Trace	Trace	Trace	Trace

Stability study on day 180

Parameters	<i>Gomutra</i>	<i>Gomutra</i> jelly	<i>Gomutra</i> ghanavati	<i>Gomutra</i> kalpa
Appearance	Liquid	Semisolid	Tablet	Granules
Color	Dark yellow	Yellow	Brownish-yellow	Brownish-yellow
Odour	Very strong ammoniac	Ammoniac	Ammoniac	Ammoniac
Ph	8.8	9.6	8.6	9.6
Specific gravity	1.03	1.03	1.03	1.03
Proteins	Trace	Trace	Trace	Trace

### Discussions:

The color and odor of *gomutra* change significantly over 6 months from yellow to dark brownish and from ammoniac to very strong ammoniac respectively.

There was no change in color and odor of *gomutra* ghanavati, jelly, and Kalpa over 6 months.

The ph of all three formulations was the same with a difference of +0.1 over 6 months.

Specific gravity was the same for all three formulations.

Proteins were found in trace amounts in all samples over 6 months.

### Conclusions:

All three formulations were having stability over 6 months.

The stability of the *gomutra* was reduced concerning color and odor over 6 months.

Stability study of these formulations should be done for long-term stability test which can be part of further studies.

The microbial load can be done for all three formulations which can be part of further studies.

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