

## PHARMACEUTICAL AND ANTI-MICROBIAL ACTIVITY OF TRIPHALA GUGGUL

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### ABSTRACT

Guggul preparation serves as important formulation in Ayurveda. Guggul is exudate of *Commiphora mukul* and many physical impurities get stuck to it hence Guggul purification become important procedure. Mostly Guggul purification is done in decoction of Triphala and Analpaka is used to prepare the various Guggul. Due to these physico-chemical properties of Guggul hampered. Hence in present study Triphala Guggul was prepared by compression method and Guggul purification was done in water according to Bhaishajya samihita.<sup>[1]</sup> Triphala Guggul showed less disintegration time and also Anti-microbial activity of Triphala Guggul was done in which it

showed activity on *E. coli*, *Staphylococcus aureus* and no activity on *Candida albicans*.

**KEYWORDS:** Triphala Guggul, Analpaka, Triphala, Pippali.

### INTRODUCTION

The Ayurveda literature is a full of praise for guggul describing its action as divine. Ayurveda describes guggul as an antiseptic, antibacterial, astringent, antispasmodic and as a carrier for other drugs. Guggul is an exudate of *Commiphora mukul* which is widely used in pharmaceutical industries. Due to sticky nature of Guggul many impurities get stuck to Guggul like Bark of tree, mud, threads etc. Hence the Guggul Purification becomes an important procedure. Due to purification not only impurities are removed but it also makes drug palatable, reduces any toxic properties if present and increases the potency of the drug. On commercial scale Guggul purification is mostly done in Triphala kwath (pericarp decoction of fruits of *Emblica officinalis*, *Terminalia chebula* & *Terminalia belerica*) by the

heating process where the temperature is too high. Due to this volatile contents of Guggul get evaporated and chances of charring of Guggul occur. Volatile contents of Guggul are important from the therapeutic point and also the extract of the Triphala get mixed with Guggul, as whole Guggul is not obtained. Hence to prevent this, Guggul purification was performed according to the Bhaishajaya samhita in water and drying of Guggul was done in the Sunlight.

Triphala Guggul available in markets are mostly prepared by the Analpaka process<sup>[3]</sup> and also ghrut is used during process which facilitates pounding and also due to ghrut Guggul tablet gains a shiny appearance. Triphala Guggul prepared by this procedure has disintegration time too high. Earlier research has concluded that Triphala Guggul prepared by the compression method has less disintegration time. Hence the Triphala Guggul was prepared according to reference of Sharangdhar Samhita madhyam khand<sup>[2]</sup>, where Guggul, Triphala and Pippali were taken in ratio 5:3:1 and Triphala Guggul vati was prepared and compression method was used.

In Garudpurana Guggul has been described as dravya which possesses, Vranashodhan and Vranaropan properties. In the vrana there are chances of infection by microorganisms. Modern science reveals that in abscess the infection is mostly caused by the microorganisms like *Staphylococcus aureus*, *E. coli* etc. Hence in the present study an effort was made to reveal the antimicrobial activity of Triphala Guggul.

## MATERIALS AND METHOD

All the drugs were procured from local market and authentication was done from botanical institution.

### Guggul purification

Guggul was examined visually and was cleaned manually to remove foreign matters like Parts of plant, stone, dry leaves, threads etc. After cleaning the foreign matter, the impure Guggul was broken into small pieces and mixed in 10 times luke warm water and mixture was kept for overnight. In morning the mixture was macerated with the hands so that guggul get mixed thoroughly with water. Then the mixture was filter with cloth. The filtrate was poured into the tray. Then the tray was kept in sunlight for drying. After few days Guggul started sedimenting at bottom of the tray and water gets evaporated. In the tray at bottom, layer of the pure Guggul was formed which was dark brownish black in colour. Pure Guggul

was pounded to get fine powder and it was filter through mesh. Then it was measured, physico-chemical analysis was done and used for preparation of Triphala guggul.

### **Preparation of Triphala and Pippali churna**

The dried mature pericarp of Amalaki (*Emblica officinalis*), Bibhitaki (*Terminalia belerica*) & Haritaki (*Terminalia chebula*) was used. The Triphala pericarp was dried in sunlight and subjected for grinding. The obtained churna was filtered through sieve no 80 to get a fine powder i.e. vastragal. Then the churna of Amalaki, Bibhitaki & Haritaki was added in equal quantity to get homogenous mixture. Then it was used for the preparation of the Triphala guggul samples. Pippali (*Piper longum*) was dried slightly in sunlight so that if any moisture present in pippali get diminished. Then Grinding was done and the obtained churna was filter through sieve no 80 to get fine state.

### **Preparation of Triphala Guggul**

According to the reference of Sharangdhar Samhita, Shudha Guggul churna, Triphala churna and Pippali churna was taken in the ratio of 5:3:1. All the churna was properly triturated for 3 days in Khalva yantra to get homogeneous mixture. After trituration, the mixture was subjected for granulation & sieved. Then the granules were transferred to Tablet punching machine and granules were further compressed to make tablet. The tablet of 250 mg was prepared and dried in sunlight and was store in glass bottles. The Triphala Guggul prepared was analysed for physico-chemical characteristics and anti-microbial activity.

### **Antimicrobial activity of Triphala Guggul by Kirby Bauer method**

Fresh cultures of organisms are prepared and incubated.

a) *Staphylococcus aureus*: 37<sup>0</sup> C for 18 to 24 hrs

b) *E. coli*: 37<sup>0</sup> C for 18 to 24 hrs

c) *Candida albicans*: 27<sup>0</sup> C for 42 to 72 hrs.

Method of disc preparation of trial drugs.

Discs of 6mm diameter was cut from Whatman filter paper no.1. Discs were sterilised and kept in the sterile plates. 200 mg of Triphala Guggul powder was dissolved in 1ml of distilled water and disc was prepared of 10 µg concentration.

a) Chloramphenicol (Standard drug)

b) Fluconazole (Standard drug)

c) Triphala Guggul Sample A (Trial drugs)

d) Triphala Guggul Sample B (Trial drugs)

## e) Triphala Guggul Sample C (Trial drugs).

The Muller-Hinton agar medium was prepared and sterilized. The sterile medium was cooled to 45<sup>0</sup> C and mixed with 20% of bacterial and fungal culture individually (i.e. 80ml media and 20ml culture). The Media was shaken well and poured to respectively labelled sterile petri plates. After solidification; standard and trial discs prepared are applied over agar surface. The plates were kept in a refrigerator for 2hrs for the diffusion of the drug into the media. After 2 hrs, plates of bacterial culture were kept in an incubator at 37<sup>0</sup> C for 18 to 24 hrs. Fungi are kept at room temperature for 42-72 hrs. The plates were observed for appearance of zone of inhibition and measured in mm.

**RESULT AND DISCUSSION****Table no 1 showing physico-chemical analysis of Triphala Guggul sample**

Tests	Sample A	Sample B	Sample C	Mean
pH	4.48	4.47	4.49	4.48
Moisture content %	5.60	5.33	4.83	5.25
Ash value %	8.37	8.45	8.23	8.35
Acid insoluble ash %	5.20	4.98	5.14	5.10
Water soluble ash %	1.97	1.95	1.97	1.96
Solubility %	51.47	55.58	56.92	54.65
Water soluble extract%	36.85	41.49	39.47	39.27
Hardness (kg/cm <sup>2</sup> )	3	4	3	3.33
Disintegration time (min)	40.23	36.49	41.36	39.36

The mean zone of inhibition on *E. coli* by Triphala Guggul sample A, sample B, sample C was 12.8mm, 14mm & 12.8mm respectively. The p value was < 0.05 And that of standard drug chloramphenicol was 10 mm. The mean zone of inhibition on *staphylococcus aureus* by Triphala Guggul sample A, sample B & sample C was 8.6mm, 12mm, 7.2mm, respectively. The p value was < 0.05 And that of standard drug chloramphenicol was 10 mm. and no zone of inhibition was found on *candida albicans*.

**CONCLUSION**

Processing of Gum Guggul in plain water and drying in sunlight proves beneficial due to following reasons. The volatile contents of the Gum Guggul processed in water are retained. Purification of Guggul shows significant changes in organoleptic characters like Rupa & Sparsha. The Shudha Guggul was Yellowish-brown in colour and Sparsha was non-sticky. During the preparation of the Triphala Guggul samples no Pharmaceutical excipients were used. The Triphala Guggul prepared by the compression method complied with the hardness

and disintegration test. Triphala Guggul showed significant activity on Gram negative organism *E. coli* and Gram Positive organism *staphylococcus aureus* as compared with the Standard Drug Chloramphenicol and Triphala Guggul showed no activity on the *Candida albicans*.

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