



## **A review of Nagam (Zinc) in Siddha medicine, unveiling the ancient wisdom and its Pharmacological properties**

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### **Abstract**

This review article explains the importance of Naagam a metal and the compound formulations made with naagam as a primary ingredient, in siddha aspect as well as scientific studies done so far. This review delves into the versatility of Naga Parpam, a nano-dose zinc formulation, for diverse therapeutic purposes. It commences with a sensory assessment confirming its traditional traits: lustrous appearance, tastelessness, and odorlessness. Chemical analysis affirms its high inorganic content, alkaline nature, and the presence of zinc without bioactive organic components. Siddha medicine endorses Naga Parpam's role in respiratory ailment treatment, highlighting its biocompatibility and precise cellular action. Mechanisms include inhibiting viral target receptors, fostering immune responses, and scavenging oxidant radicals. The antioxidant potential of Naaga Sangu Parpam is substantiated through tests, demonstrating efficacy against DPPH, Nitric Oxide radicals, ABTS, and Hydrogen peroxide. Furthermore, the anti-inflammatory capabilities of zinc oxide are revealed through the dose-dependent reduction of key inflammatory markers. The impact of Naga Parpam on Hep2 cell lines shows a significant decrease in cell viability at specific concentrations, indicating its antiproliferative potential. Lastly, Naga Sangu Parpam's analgesic properties are evaluated using Eddy's Hot Plate method, with notable effects at both 13 mg/kg and 26 mg/kg, underlining its promise as a pain relief option. In sum, this review presents a thorough exploration of Naga Parpam's attributes and its promising applications in the field of medicine.

**Keywords:** Zinc, Naagam, Anti-oxidant, Anti-cancer, Analgesic, Anti-inflammatory.

## Introduction

Naagam, also known as zinc, is a naturally occurring mineral that holds significant importance in Siddha medicine, a traditional system of medicine in South India. In Siddha medicine, minerals and metals play a crucial role in the preparation of medicines, and Naagam is no exception. It is believed that Naagam, when properly processed according to the principles outlined in classical Siddha literature, can be used as an effective medicine for treating various ailments. This practice is deeply rooted in the Siddha system's holistic approach to healthcare.

## Materials and Methods:

Pharmacological Activities of naagam and its formulations were reviewed in siddha classical literatures, various journals, various online databases like google scholar, PubMed, Research gate, scopus, Web of science, Science direct.

## Results:

### Nagam <sup>[1]</sup>:

Nagam (ZINC) is usually occurred along with the combination of other elements. After separation it occurs in a combination of blue and white colour. It is soluble in acids. When copper is added to copper it changes to brass.

### Types:

It is of two types.

1. Perunkann naagam
2. Sirukann naagam.

### Purification of naagam:

An adequate amount of iluppai ghee was taken in a vessel and two solid pieces of navacharam was placed at the inner edges of the vessel such that half of those pieces were immersed in it.

The Naagam was then taken in a small iron pot, melted and poured into the vessel containing ghee and navacharam mixture. Every time it was taken washed, melted and poured in that vessel. This

process is repeated 21 times to obtain the purified naagam.

### Actions:

- Astringent,
- hemostatic action,
- General tonic.

### Indication:

It is used to treat megam (venereal diseases), Bethi (diarrhoea), Vellai (leucorrhoea) etc.,

Nagam is primary ingredient for many formulations such as naaga parpam, naga chendooram, naga rasa parpam, naga sangu parpam etc.,

### Preparation of Nagaparpam:

Purified naagam was taken and leaf juices of ammaanpacharisi (*Euphorbia hirta*) and Thuthi (*Abutilon indicum*) was taken and grinded separately and subjected to incineration process after each time grinded.

Indication: Dysentery (seedhabedhi)

### Preparation of Naaga chendooram:

Purified naagam was powdered, taken and grinded with the young bud juices of Kaandhal (*Gloriosa superba*), Alli (*Lilium candidum*), paagal (*Momordica charantia*), Sangan (*Azema tetracantha*), Agathi (*Sesbania grandiflora*), Kilimalligai (Jasmine) and made into dried villai in the shape of coins and sealed in a mudpot with a muslin cloth and clay mixture and subjected to incineration process.

## Pharmacological review:

### Naaga parpam:

### Physico-chemical, biochemical analysis<sup>[2]</sup>:

Zn needs to be administered in a harmless form and must also enter the cells. Zn should therefore be replaced as a nanoparticle so that it can enter the cell. Naga Parpam is therefore taken into

account for this investigation. The preliminary classical organoleptic investigation of Naga parpam revealed, according to the study's findings, that it met all of the traditional characteristics of parpam (such as being lustrous, tasteless, and odorless, among others). This study found that Naga parpam had a high percentage of total ash value (i.e., high inorganic content) and was alkaline in nature according to preliminary physicochemical examination. The chemical study of Naga Parpam revealed that it contains zinc, which was revealed by the phytochemical analysis to be devoid of bioactive organic components.

### **Respiratory effect [3]:**

In Siddha medicine, Naga Parpam (NP), a nano-dose form of zinc, is praised for its demonstrative role in curing respiratory afflictions with or without an infectious background. Zinc oxide (ZnO), the primary component of NP, which is in the nanoscale, controls the therapeutic outcome of the medication due to its excellent biocompatibility and tailored action at the cellular level without causing any harm. The direct competitive inhibition of key cellular target receptors of the virion, the stimulation of in-area host immune responses, as well as numerous other systematic cellular responses like oxidant radical scavenging, are just a few of the ways that zinc ions respond to any pathogenic assaults of viral origin.

### **Naaga chenduram:**

#### **Antioxidant property [4]:**

Naaga chenduram 200 g/ml antioxidant activity of DPPH test demonstrates 43.35163 Percent inhibition.

### **Naaga sangu parpam:**

#### **Anti-oxidant property [5]:**

DPPH (2,2-diphenyl-1-picrylhydrazyl), Nitric Oxide Radical Scavenging, ABTS Radical Scavenging activity, and Hydrogen Peroxide Scavenging activity were used to test the antioxidant activity of Naaga Sangu Parpam. With IC50 values of 152.44.49, 103.57.86, 146.518.65,

and 156.521.64 g/ml, respectively, NSP demonstrated antioxidant activity against DPPH, Nitric Oxide radicals, ABTS, and Hydrogen peroxide.

### **Anti-inflammatory activity [6]:**

In a study, the anti-inflammatory properties of zinc oxide were demonstrated by the dose-dependent suppression of iNOS, COX-2, IL-1, IL-6, and TNF- protein and mRNA expression.

### **Analgesic activity [7]:**

In a study assessing analgesic activity using Eddy's Hot Plate method, Naaga Sangu Parpam at a dose of 13 mg/kg demonstrated significant analgesic effects ( $P < 0.05$ ) at both 120 minutes and 180 minutes compared to the control group. Additionally, at 26 mg/kg, the drug exhibited analgesic activity with even greater significance ( $P < 0.01$ ) at 60 minutes and 120 minutes and highly significant effects ( $P < 0.001$ ) at 180 minutes. The higher dose of Naaga Sangu Parpam (26 mg/kg) showed superior analgesic activity compared to the lower dose and the control group.

### **Nagarasa parpam [8]:**

Nagarasa parpam has an antiproliferative impact on Hep2 cell lines, according to the results of the MTT experiment. The cells' viability is determined to be 39% and their inhibitory rate to be around 61% when administered at a concentration of 100 g/ml.

## **Conclusion**

Naagam, or zinc, holds a significant place in Siddha medicine. When properly processed and prepared according to classical Siddha literature, it can be used to treat a variety of health conditions. The Siddha system's emphasis on purification, precise processing, and the amalgamation of minerals and herbs underscores its commitment to a holistic approach to healthcare. While Siddha medicine has been practiced for centuries, it is important to note that the use of Naagam and other mineral-based medicines should be under the guidance of trained Siddha practitioners to ensure safety and efficacy.

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