

Clinical Efficacy of Standardized *Palash Kshar* and *Nirdaha Rasa* in Coronary Artery Disease

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Abstract

Coronary Artery Disease (CAD) remains a leading cause of death globally, resulting from the hardening and narrowing of arteries due to atherosclerotic plaque buildup. Modern medicine offers limited and often irreversible treatment for CAD. This study investigated the clinical efficacy of standardized *Palash Kshar* and *Palash Nirdaha Rasa* in treating human subjects with CAD. Both preparations were manufactured and standardized using traditional and modern analytical methods, including pharmacognostic evaluation, pH/temperature monitoring, and elemental analysis via Atomic Absorption Emission Spectrometry (AAES) and Inductively Coupled Plasma-Atomic Emission Spectrometry (ICP-AES). The clinical efficacy was assessed in a 60-day placebo-controlled comparative study involving 30 subjects with multiple blocks. Results indicated that *Palash Kshar*, particularly that

prepared from *Jangal Desh* root bark using the *Shushrut Samhita* method, provided maximum elemental concentration and showed significant clinical benefits, including relief in cardinal symptoms in all patients, re-canalization of arteries, and reduction of plaque. *Palash Kshar*, rich in potassium and high pH (13-14), is postulated to work through its hydroxyl compounds, aiding in endothelial cell re-growth, chelation of calcium deposits, and increasing HDL.

Keywords

Coronary Artery Disease, *Palash Kshar*, *Nirdaha Rasa*, Atherosclerosis, *Kaphagranthivilayan*, Hydroxyl compounds, Potassium.

Introduction

Coronary Artery Disease (CAD) is the most frequent type of heart disease and is a primary cause of death worldwide. CAD is characterized by the hardening

and narrowing of arteries supplying blood to the heart muscle, a condition resulting from the accumulation of cholesterol and plaque on the inner walls, known as atherosclerosis. In Ayurveda, *Palash Kshar* is traditionally recognized for its *Kaphagranthivilayan* and *medoarsohghana* properties. *Kshar* is also noted for its *Chhedy* and *vidaran* (lypolsis) qualities. Given the limited and often irreversible nature of modern medical treatment for CAD, this research aimed to explore the efficacy of traditional Ayurvedic preparations. While *Palash Kshar* is known, *Palash Nirdaha Rasa*, though mentioned in *Charak Samhita*, had not been previously extracted and utilized in human subjects prior to this attempt by the author.

Aim and Objects

The primary aim of this research was to prepare, standardize, and test the clinical efficacy of *Palash Kshar* and *Palash Nirdaha Rasa* in human subjects suffering from Coronary Artery Disease (CAD).

The specific objectives were:

1. To prepare *Palash Kshar* using three different traditional methods.
2. To extract and prepare *Palash Nirdaha Rasa* using *Charak Samhita*, *Adhapatan yantra*, and *Tirryak patan yantra* methods.
3. To standardize the raw material, in-process *kshar*, and finished drugs using pharmacogenetic and analytical parameters (e.g., pH, elemental analysis).

4. To evaluate the clinical efficacy of standardized *Palash Kshar* and *Nirdaha Rasa* in CAD patients by recording pathological parameters before and after 60 days of treatment.

Material and Methods

Preparation of Drugs

Palash Kshar Preparation: *Palash Kshar* was prepared in the institute's laboratory utilizing three distinct methods:

1. *Sushrut Samhita* (su 11/2) method, using water six times the amount of *bhasma*.
2. *Chakradatta* (chi 5/138-142) method, using water four times the amount of *bhasma*.
3. *Rasatrangini* (14/59-61) method, using water eight times the amount of *bhasma*.

Palash Nirdaha Rasa Extraction: *Palash Nirdaha Rasa* was extracted in *Kasheli*, *Karjat*, *Thane* district. The preparation involved three methods: *Charak samhita*, *Adhapatan yantra*, and *Tirryak patan yantra*.

For the *Charak Samhita* method, a secondary root of a middle-aged tree was exposed and cut. A vessel was placed underneath to collect the *Rasa*, and the exposed root was covered with cow dung cakes and ignited for a day. Due to a very low yield with the *Charak Samhita* method, an *Adhapatan yantra* and a *Tirryak patan yantra* were designed to maximize yield. The maximum yield was ultimately obtained using the *Tiryaak patan yantra*.

Standardization of *Palash Kshar* and *Nirdaha Rasa*

Standardization was performed on the raw material, in-process *kshar*, and finished products:

- **Raw *Palash*:** Standardized using the pharmacognostic method.
- **In-process *kshar* preparation:** Standardized based on parameters such as pH and temperature.
- **Finished drug:** Standardized for elemental presence using Atomic Absorption Emission Spectrometry (AAES) and Inductively Coupled Plasma - Atomic Emission Spectrometry (ICP-AES).

Clinical Efficacy Study Design

A placebo-controlled comparative study was conducted over 60 days to assess the clinical efficacy of *Palash Kshar* and *Nirdaha Rasa*.

- **Place of Study:** Smt. KGMP Ayurvedic College, Charni Road, Mumbai.
- **Subjects:** A total of 30 subjects were recruited, divided into three groups of ten subjects each.
- **Route of Administration:** Oral.
- **Key Inclusion Criteria:** Male and females aged 40-60 years with multiple blocks.
- **Key Exclusion Criteria:** Patients above 70 years, patients with other heart diseases (e.g., Mitral valve prolapse), and subjects with low platelet count or other bleeding disorders.

Doses:

- ***Palash Kshar*:** 250 mg twice a day, before food.
- ***Nirdaha Rasa*:** 10 ml twice a day for the first eight days, followed by 20 ml twice a day for the next eight days, and then 20 ml thrice a day until 60 days, before food.

Evaluation Criteria

Pathological parameters were assessed prior to drug administration and after 60 days. These included lipid profile, stress test, and 2-D echo. Angiography was performed on three willing subjects both before and after the 60 days of dosing.

Observations

Drug Yield and Analytical Data

Palash Kshar made using the *Shushrut Samhita* method provided the maximum yield of elements, including potassium, magnesium, and selenium. The *Tiryaak patan yantra* provided the maximum yield of *Nirdaha Rasa*.

- **Yields:** The maximum yield of *Palash Kshar* was approximately 5%. The maximum yield of *Nirdaha Rasa* was 1.5 litres after 24 hours of collection.
- **Raw Material Details:** The total weight of *Palash* root bark used was 25 kg, which yielded 10.99 kg dry weight and 1.100 kg *bhasma* weight, resulting in 95 gms of *Kshar* (approximately 5%).
- **pH:** *Palash* procured from *Anup desh* showed a pH of 10.5, while *Palash* procured from *Jangal*

desh showed a pH between 13-14. *Nirdaha Rasa* prepared by the *Charak* method had a pH between 2-4.

Elemental Concentration

Palash Kshar from *Jangal Desh*, prepared via *Shushrut Samhita*, showed the maximum concentration of elements (in 250 mg of *Palash Kshar*):

- Magnesium: 0.0225 mg
 - Potassium: 0.0195 mg
 - Sulphur: 0.01125 mg
 - Chlorine: 0.03625 mg
 - Ferrous: 0.01975 mg
 - Selenium: 0.001 mg
- Palash Nirdaha Rasa* prepared by *Charak Samhita* methods showed the following elemental concentrations:
- Magnesium: 191 micro gm/ml
 - Potassium: 290 micro gm/ml
 - Sodium: 34 microgram/ml

Results

Clinical Study Results

Palash Kshar Group: All patients treated with *Palash Kshar* showed **relief in cardinal symptoms**, including *Hridhrava*, *Hridhol*, exertional dysnea, and *urhavedna*. Specific objective improvements recorded were:

- Two patients showed complete **re-canalization of the carotid artery**.
- One patient showed **partial re-canalization of the renal artery**.

- Two patients showed complete **re-canalization of the circumflex artery**.
- Two patients demonstrated a **50% reduction of plaque** in the LAD artery.
- Two patients showed a **5% increase in ejection fraction** in 2D echocardiography.
- Five patients showed improvement in the Stress test by 1 meter.
- One patient showed CST improved by 1 meter.
- One patient who followed up after six months showed **no re-occurrence of atherosclerosis**.

Nirdaha Rasa Group: Only 50% of the patients in the *Nirdaha Rasa* group experienced relief in cardinal symptoms such as *Hridhrava*, *Hridhol*, exertional dysnea, and *urhavedna*.

Discussion and Conclusions

Palash Nirdaha Rasa was found to be highly useful, however, the minimal yield necessitated extraction using the *Tiryakpatan yantra*, which resulted in a lower mineral content. The author successfully prepared and standardized *Nirdaha Rasa* for the first time. The source of *Palash* and the preparation method significantly influence the treatment outcome for CAD. *Palash Kshar*, particularly the variety obtained from *Jangal Desh* with a pH of 13-14, contains a maximum percentage of potassium. It is postulated that the compounds present in this preparation

may include potassium hydroxide and other hydroxyl compounds.

Mechanism of Action Postulated:

These hydroxyl components are hypothesized to play a key role in the efficacy of *Palash Kshar*:

- The hydroxyl group may stimulate the **re-growth of endothelial cells** and inhibit smooth muscle cell growth.
- Hydroxyl components are thought to **chelate with calcium** in the plaque deposits, facilitating the transport of this calcium to the kidney for excretion.
- The hydroxyl group aids in the synthesis of Collagen, which is essential for the structural integrity of blood vessels.
- Hydroxylation is also important for the synthesis of Glycosaminoglycan (CAG), which stabilizes Arterial endothelial cells.
- The hydroxyl group also appears to **increase High-Density Lipoprotein (HDL)**, which transports fat cells away from the artery walls to the liver for systemic removal.

The positive results obtained provide a lead for Ayurvedic scholars and physicians to formulate improved Ayurvedic preparations to better treat *Hridhamnigat Avarod*, or Coronary Artery Disease. It is postulated that the potassium found in *Palash Kshar* is crucial in breaking the etiopathogenesis

Pictures:

of CAD, proving useful in re-canalizing the coronary artery, and preventing future myocardial infarction.

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Figure 1 :
Preparation of Nirdaha Rasa (Charak Samhita) (a) Exposed secondary root and (b) vessel at the terminal end of root covered with cow dung, ready for ignition and (c) Palash Nirdaha Rasa obtained.



Figure 1(a)



Figure 1(b)



Figure 1(c)

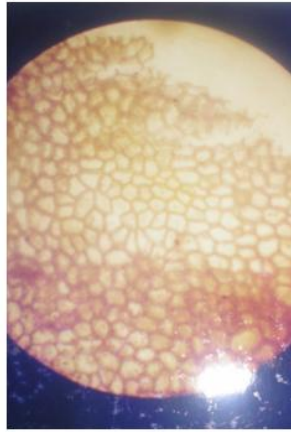
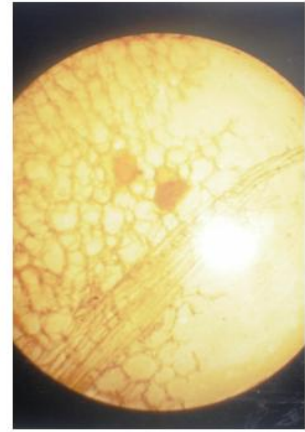
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Figure 2 :
Preparation of Nirdaha Rasa using Adhapatan Yantra



Figure 3:

Pharmacognostical evaluation of root bark (a) Transverse section of cork cell and stone cells in 2-3 layers under microscope (b) Cork cell in surface view under microscope and (c) Longitudinal section of root bark showing lignified cells under microscope

**Figure 2(a)****Figure 2(b)****Figure 2(c)**

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