

## Comparative phytochemical analysis of *Shorea robusta* Gaertn (oleoresin) WSR to its seasonal collection

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**Abstract:** The oleoresin of the *Shorea robusta* Gaertn is called as *Shala niryasa*, *Rala*, *Sarja rasa* which has the chemical constituents such as nor-triterpene, dammarenolic acid, asiatic acid, dipterocarpol, triterpenic acid, tannic acid and phenolic content and possesses antibacterial, analgesic and wound healing effect.

The medicinal property of the plant is highly influenced by the the season in which it is cultivated and collected. The classical texts of Ayurveda provide guidelines on the time of collection of raw drugs. Hence following these indications the oleoresin was collected in two seasons as per reference of Acharya Charaka and Susrutha in *Hemantha rutu* (Dec-Jan) and *Vasantha rutu* (April-May) respectively. Analytical studies revealed that the oleoresin collected in *Vasantha rutu* contained more tannin, resin, volatile matter, phenolic content, which are the active ingredients of the drug as compared to the oleoresin collected in *Hemantha rutu*. This is a preclinical work and further clinical study has to be done to prove efficacy of the seasonally collected samples.

### Introduction

The medicinal property of the plant depends upon the season in which they are grown and collected. For this our ancient acharyas have given some indications of the seasons, time for collection and specific part to be selected of raw drugs. The quantity of the active principles differs from plant to plant, according to season, age of the plant and different parts of the plant. The quantity of the active principles is believed to be responsible for the rate of drug action.

The oleoresin of *Shorea robusta* Gaertn is called as *shala niryasa*, *rala*, *sarja rasa* etc. which is known for the therapeutic properties such as antibacterial, astringent, analgesic and wound healing effect. It has chemical constituents such as nor-triterpene, dammarenolic acid, asiatic acid, dipterocarpol, triterpenic acid, tannic acid and phenolic content<sup>1</sup>.

This work was intended to evaluate the chemical constituents of the *Shala niryasa* which was collected in two seasons as per the reference of Acharya Charaka and Susrutha in *Hemantha rutu*<sup>2</sup> (Dec-Jan) and *Vasantha rutu*<sup>3</sup> (April-May) respectively from the well identified and authenticated *Shorea robusta* Gaertn tree by botanical experts / Professor of Department of Botony, J.C B.M College, Sringeri, Karnataka.

### Materials and Methods

The oleoresin was collected in two seasons accordingly in *Hemanta* and *Vasantha rutu* from a well identified *Shorea robusta* Gaertn tree as said above and named as Sample A and Sample D respectively as shown in Fig I.

The standard method was followed for the collection of the resin as per the C.C.R.A.S guide lines.

- Tapping time *Hemantha rtu* (Dec-Jan), *Vasantha rtu* (April May)
- Age of Plant - 25 to 27 yrs.
- Tapping instrument Axe.
- Number of incisions per plant 2 to 4
- Incision on the part of the plant - Main trunk.
- Distance between the two incisions 30 to 40 cms
- Interval between tapping and gum collection 15 to 20 days.
- Interval between two collections 10 to 15 days
- Types of Incision Cuts made horizontally at 60° angle.
- Depth of incision 3 to 5 cms.

In about 15 to 20 days the grooves get filled with the resin which exudates as the liquid and continues to change its color as it dries gradually to yellow and then brown stalactitic pieces.

The chemical analysis was carried by following standard methods for the two seasonally collected samples. The analytical specification is provided in Table I. This is compared with the standard values of the *Shorea robusta* Gaertn oleoresin.<sup>4,5</sup>

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- Specific Gravity 1.097 - 1.123
- Total ash Not more than 1%.
- Acid Insoluble ash Negligible.
- Alcohol soluble extractive Not more than 60%
- Acid Value 22-24

The Thin layer chromatography and High performance thin layer chromatography of both the samples were done to know the number of components in the resin samples following the standard methods and are shown in Fig II and Table II.

**Identification of components by Thin layer chromatography and High performance thin layer chromatography**

2gm of *Shorea robusta* Gaertn resin coarse powder was macerated with 25ml of methanol for 1hr, filtered

and made up to a volume of 50ml and used.

Plate/Stationary phase Silica gel G

Solvent front run up to 9cm

Derivatization: Vanillin sulphuric acid, Anisaldehyde sulphuric acid, 5% FeCl<sub>3</sub>- 2NHCl

Applicator Capillary tube.

Solvent / Mobile phase Toluene: ethyl acetate: methanol: acetic acid 8.5 : 1.5 : 0.5 : 0.5

**Result and Discussion**

**TABLE I**

TEST	SAMPLE A ( <i>Hemantha ruti</i> ).	SAMPLE D ( <i>Vasantha ruti</i> )
Foreign matter	Less than 1%	Less than 1%
Sand and Silica	Absent	Absent
Ash content	0.4	0.35
Acid insoluble ash	Negligible	Negligible
Moisture Content	3.1%	2.4%
Different Solvent extractive value	2.5%	1.44%
• Water	92%	98.4%
• Benzene	92.72%	98.24%
• Alcohol		
Volatile matter	1.16%	1.87%
Acid value	22.1	22.2
Tannin as Tannic acid	0.32%	1.5%
Resin content	78.0%	90.8%
Specific gravity	1.0008	1.0008
pH estimation	5	6
Hardness estimation	2	2

TABLE II R<sub>f</sub> VALUES

Track Number	Sample Applied	R <sub>f</sub> values @ 254nm	R <sub>f</sub> values @ 366nm	R <sub>f</sub> Values After Treating With Anisaldehyde Sulphuric Acid, Vanillin Sulphuric Acid
A ( <i>Hemantha rutu</i> ).	5µl	0.80, 0.75, 0.69, 0.63, 0.52, 0.46, 0.41, 0.32, 0.18	0.80, 0.63, 0.52, 0.46	0.67, 0.55, 0.50, 0.44, 0.21
D ( <i>Vasantha rutu</i> )	5µl	0.11, 0.17, 0.20, 0.24, 0.36, 0.46, 0.59	0.19, 0.25, 0.36, 0.46, 0.52, 0.62 (Blue fluorescent)	0.09 (dark violet), 0.19 (violet), 0.21 (violet), 0.23 (dark yellow), 0.37 (dark yellow), 0.46 (violet), 0.50 (dark yellow), 0.53 (violet), 0.58 (dark brown), 0.64 (pink), 0.70 (light violet)

### Discussion and Conclusion

Pharmacopoeial standards can be laid down by performing the chemical analysis of oleoresin. On the basis of the phyto-chemical methods carried out in this study the Sample D (*Vasantha rutu*) has given better values of tannic acid, resin content, volatile matter and acid value compared to the Sample A (*Hemantha rutu*).

On subjecting to the Thin layer chromatography and High performance thin layer chromatography, the R<sub>f</sub> value of 0.57 (dark blue) and 0.53 (dark blue) were identified by spraying 1% FeCl<sub>3</sub> in 2N HCl which are indicative of presence of tannin and phenolic components. The R<sub>f</sub> value of 0.46 present in both the sample represents the essential oil component Carvone<sup>6</sup>.

Clinical studies can be carried out to confirm the variation observed in seasonally of *Shorea robusta* and thus prove their therapeutic efficacy.

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