

**SIGNIFICANCE OF ANTARIKSHA JALA IN PREPARATION OF ANU
TAILA– A COMPARATIVE STUDY**

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ABSTRACT

Sneha kalpanas are administered through different routes as different procedures like Abhyanga, Pana, Nasya, Basti and karna purana. Taila Kalpana is one of the best among different dosage forms as the water soluble properties are brought into the Sneha and administered and this can be even used externally. Nasya is one of the most efficient therapy in urdhwanga vyadhis in which medicament is administered through nasal route. Anu taila is one such taila Kalpana which is indicated in nasya by most of the acharyas. The uniqueness in the preparation of Anu taila is that almost all the acharyas have mentioned Antariksha jala as the Drava Dravya. So Contemplating this, a comparative pharmaceutico analytical study will be carried out using different types of water to acknowledge if the rain water is more efficacious than the tap water and RO water and to standardize the water to be used in preparation of Anu Taila.

INTRODUCTION

Anutaila,^[1] is one of the Sneha yogas which is used in nasya by almost all the Acharyas. It has qualities like Mahagunavaan,^[1] Indriya dardyakara, Keshya, Twachya, Kantya, Preenana,

Brumhana and Tridoshaghna.^[2] Anandakanda says Anutaila Nasya is Shrestatama in all the Rtus and mentions alternatives in the absence of Anu taila. He also gives a unique method of Administration of Anu taila which is not explained anywhere else.^[3]

Antariksha Jala is said for the preparation of Anu taila which is unique.^[1] It is said to be the purest form of water and it is Amrutha, Jeevana, Tarpana, Dharana, Ashwasana Janana, Shrama-klamahara, Pipasahara, Mada-Murcha-Tandra-Nidra-Daha Prashamaka and Pathyatama.^[4] So, there is an obligatory need for the study of importance of Antariksha Jala in Anu Taila. Contemplating this a comparative pharmaceutico analytical study was carried out using different types of water to acknowledge if the rain water is more efficacious than the tap water and RO water and to standardize the water to be used in preparation of Anu Taila.^[5] Here reference of Astanga Hridaya is taken since it is mentioned in Ayurvedic Formulary of India and many companies follow the same.

MATERIALS AND METHODS

I. Ingredients

SL.NO	SANSKRIT NAME	BOTANICAL NAME	PART USED
1	Jeevanti	<i>Leptidinia reticulata</i> (Retz.) Wight & Arn	Root
2	Jala	<i>Pavonia odorata</i> Willd	Root
3	Devadaru	<i>Cedrus deodara</i> (Roxb)Loud	Bark
4	Jalada	<i>Cyperus rotundus</i> Linn	Tubers
5	Twak	<i>Cinnamomum verum</i> J.Pres	Bark
6	Sevya	<i>Vetivera zizanioides</i> (Linn)	Root
7	Gopi	<i>Hemidesmus indicus</i> (L.)R.Br	Root
8	Hima	<i>Santalum album</i> Linn	Heart wood
9	Darvi twak	<i>Berberis aristata</i> Dc.	Bark
10	Madhuka	<i>Glycerrhiza glabra</i> Linn.	Root
11	Plava	<i>Cyperus esculentus</i> Linn.	Rhizome
12	Agaru	<i>Aqualaria agallocha</i> Roxb	Resinous wood
13	Shatavari	<i>Asperagus racemose</i> Willd	Rhizome
14	Pundrahva	<i>Nymphaea lotus</i> Linn.	Whole plant
15	Bilwa	<i>Aegel marmelos</i> (Linn) Correa.	Root
16	Utpala	<i>Nymphaea stellata</i> Willd.	Whole plant
17	Bruhata	<i>Solanum indicum</i> Linn	Root, fruit
18	Kantakari	<i>Solanum surretense</i> Burm.f.	Whole plant
19	Surabhi	<i>Alpinia officinarum</i> Hance	Leaves
20	Shalaparni	<i>Desmodium gangeticum</i> De	Whole plant
21	Prushnaparni	<i>Uraria picta</i> Desv.	Root
22	Krumihara	<i>Embelica ribes</i> Burm.f.	Seed
23	Ela	<i>Elleteria cardamom</i> Maton	Seed
24	Renuka	<i>Vitex nigundo</i> Linn.	Seed
25	Kamala kinjalka	<i>Nelumbo nucifera</i> Gaertn.	Pollen
26	Bala	<i>Sida Cardifolia</i> Linn	Root

Pharmaceutical Study

- One part of drug is boiled with 100 parts of water and Reduced to 1/10th
- The quantity of Taila is taken equal to 1/10th of the obtained Kashaya.
- The obtained Kashaya is divided into 10 equal parts.
- Sneha Paka will be done in general method taking each part of kashaya.
- Procedure is repeated for 9 times.

In the 10th Paka, Aja Dugdha is added in equal quantity to that of Taila and Sneha paka is done

RESULTS

II. Analytical Tests of Water Samples

PARAMETERS	RAIN WATER	RO WATER	TAP WATER
ODOUR	AGREEABLE	AGREEABLE	AGREEABLE
TURBIDITY	<0.5	<0.5	<0.5
pH VALUE	7.5	7.5	7.5
TOTAL DISSOLVED SOLIDS	47	31	872
TOTAL HARDNESS AS CaCO ₃	45	20	625
SULPHATES AS SO ₄	<1	<1	45
FLOURIDE AS F	0.1	0.1	0.1
IRON AS FE	<0.1	<0.1	<0.1
COLOR	<5 HZ	<5 HZ	<5 HZ
NITRATES AS NO ₃	4	<2	14
ZINC AS ZN	4	<0.1	<0.1
ALUMINIUM AS AL	<0.02	<0.02	<0.02
BORON AS B	<0.1	<0.	<0.1

III. Analytical Reports of Anu Taila Test.

TESTS	RAIN WATER	RO WATER	TAP WATER
physical description	Complies	Complies	Complies
Acid value	5.26	5.10	5.19
Iodine value	61.49	59.98	104.83
Refractive Index	1.472	1.470	1.470
Saponification value	196.61	185.60	184.2
Peroxide value	0	0	0.37
Viscosity	72.2 Poise	72.2 Poise	85.1 Poise

IV. Microbiological Test.

BACTERIA	RAIN WATER	RO WATER	TAP WATER
E coli	Absent	Absent	Absent
Salmonella spp	Absent	Absent	Absent
Staphylococcus aureus	Absent	Absent	Absent
Shigella spp	Absent	Absent	Absent
Pseudomonas aeruginosa	Absent	Absent	Absent
Total microbial plate count	<10CFU/g	<10CFU/g	<10CFU/g
Total yeast and mold	<10CFU/g	<10CFU/g	<10CFU/g

Analytical discussion of taila**Physical Description****Colour**

- Colour of the taila was darker because of the colour of the kalka Dravya added.
- Cloudy appearance was observed in the sample prepared of rain water.
- Sedimentation of fine particles was seen at the bottom of the taila prepared of tap water.

FRAGRANCE - Since most of the drugs had Sugandha, good fragrance was observed. The fragrance was more evident in the Anu taila prepared of Tap water.

TOUCH – Taila prepared of tap water was more thick(viscous) on touch compared to the samples prepared of Rain and RO water.

INSTRUMENTAL STUDY

- **Ph** pH value is same for all the samples of Anu taila. Even though there is high concentration of salts in tap water pH of Anu Taila prepared of it is same. It might be because of precipitation of salts due to continuous boiling and sedimentation of salts,^[97] at the bottom of taila.

Acid value

- The acid value indicates the presence of free fatty acids in the oil sample. The free fatty acids are responsible for the rancidification of oil. Higher fatty acid content of oils makes it faster rancid.^[9]
- The more the acid value more the oxidation of that substance, if we know the acid value then the quality status can be determined.^[10]
- In the above 3 samples Acid Value of Rain water sample is slightly more compared to RO and tap water samples and Acid value of RO water sample is less compared to Tap water sample.

- But even though Acid value of Rain water sample is slightly more, looking into other values the stability of Tap water sample is very low compared to Rain water.

Viscosity

- Viscosity is resistance of a liquid to flow. The higher value indicates the more solutes or the concentration of that liquid.^[9]
- Several authors have studied how water viscosity varies when a particular soluble compound, such as sodium chloride or potassium chloride, is added. As could be expected, the higher the salt concentration, the higher the viscosity of the solution.^[11]
- Viscosity of tap water sample was greater compared to the RO and Rain water. The salts which are present in the Tap water might be responsible for the increased viscosity.
- It is said that the clearance rate of solution decreases with increase in the viscosity. So increased viscosity may result in delayed therapeutic effect.^[12]

Iodine value

- The iodine value indicates the degree of unsaturation, which in turn denotes the rancidification of oils.
- Iodine value is more in sample prepared of Tap water compared to other samples indicating more active principles.^[9] It also signifies the degree of rancidification, since the iodine value is very high in tap water sample, it is highly susceptible to rancidity.

Peroxide value

- The peroxide value indicates the degree of rancidification of oils. The increase value shows that the oil is turned rancid or spoiled.^[9]
- Peroxide value of sample prepared of tap water is higher indicating faster rancidation.

Saponification value

- The saponification value indicates the average molecular weight/chain length of all fatty acids present. The longer chain fatty acids have a low saponification value and the shorter chain fatty acids have a high saponification value. Shorter chain fatty acids have faster rate of absorption than longer chain fatty acids.^[9]
- Saponification value of Rain water sample is slightly higher compared to RO and Tap water sample indicating its faster rate of absorption of Rain water sample.

- Saponification value of Rain water is slightly higher which signifies chances of rancidity. But considering other parameters the vulnerability of sample prepared of Tap water is very high.

Refractive index

The increase in refractive index value indicates the factors which are responsible for the refraction of light through oil sample.^[9] Refractive index of a solution depends on the concentration of solute.^[13] Refractive index of all the sample is same indicating same amount of active principles present in all the samples. Here since in all the samples same amount of Kalka Dravya is being used same amount of active principles can be expected.

ANALYTICAL DISCUSSION

- Tap water and Rain water samples have same refractive index eventhough tap water has plenty amount of salts in it, This might be because the water is heated so many times and the salts get precipitated and gets settled at the bottom. So because of sedimentation at the bottom the taila might not have much salts to alter the refractive index.
- Zinc is a nutrient found throughout the body and helps in maintainance of immune system and metabolism function. Zinc is also important to wound healing and sense of taste and smell.^[14]
- The mechanisms for how zinc might work include broad spectrum antiviral properties in vitro against most of the common respiratory viruses, including coronaviruses. Zinc is important for immunity, inflammation, haemostasis, ACE 2 activity and also assists with tissue responses to hypoxia. zinc has garnered attention during the global COVID-19 pandemic.^[15]
- Some studies have shown that hair follicles are closely intertwined with parts of the immune system that support healthy hair growth. As a result, a zinc deficiency is thought to be associated with hair loss. For this reason, zinc supplements have historically been recommended as a hair loss treatment.^[16]
- As we look into the reports of water, we see that the total solids, alkalinity, and other values are at the extreme levels in case of tap water, so this might lead to nasal irritation and also cause many other conditions like Dryness, burning, allergy, inflammation etc because of its abrading nature and sensitivity of the mucous membrane.
- In case of RO and rain water the values are within the limits but compared to RO water, Rain water has more alkalinity and other salts. This might help in proper absorption of

taila. According to some studies the mild alkalinity helps in relieving the nasal blockage.^[17] So it can be inferred that the medicine with mild alkalinity will get absorbed faster and helps in treating the condition in faster manner.

- Though there is slight higher value in the Acid value and Saponification value of Rain water, The Iodine value of Tap water is too high which signifies high vulnerability for getting Rancid. So compared to samples prepared of RO and Rain water the Tap water sample of Anu taila is extremely unstable.
- Microbiological Tests of the taila show no microbial contamination as the taila as well as jala is boiled for many times and stored in airtight container.
- So looking into all the facts it can be concluded that Tap water cannot be taken for the preparation of Anu taila as it has got many unfavourable results.
- In RO and Rain water, the values are within the limits so they can be considered in the preparation of Anu Taila. But The rain water should be collected in the proper season and with proper care. Again the quality of rain water depends on the area in which it is collected.
- So looking into all the facts, RO water can be used in the place of Rain water in the preparation of Anu taila but Rain water proves to be better as it contains many minerals which are desirable in treating many conditions.

CONCLUSION

- Taila Kalpana is one of the best among different dosage forms as the water soluble properties are brought into the Sneha and administered and this can be even used externally.
- Anu taila is mostly indicated in urdhva jatruja roga harana as it is said to be used as nasya and it is said to be keshya, kantya, tvachya, prinana, brumhana, tridosha and mahagunavan.
- Quantity of taila obtained in Antariksha jala sample was more compared to other two samples.
- Going through all the results and understanding logically it can be concluded that Rain water sample of Anu taila is best among the three samples taken for the study.

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