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Research Article

An Analytical Study to Assess the Effect of *KalushaPrasadanDravya* in Purification of Water W.S. R. to *Gomeda*

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ABSTRACT-

Water is the most important environmental factor for human survival. Without water man cannot survive more than 5 days. Water is essential and predominant constituent of cell protoplasm. Absence of clean water and sanitation are major risk for health. In developing countries water quality remains the major concern. In today era, it is time to look over the natural ancient concept which purified the water thousand years ago. *Ayurveda* especially *Sushruta Samhita* emphasize the various methods of purification of water on the basis of the amount of contamination. So, here an attempt made to evaluate the effect of *Gomeda* among the *Sapta Kalusha Prasadana Dravya* in yielding the potable water. The Sample of untreated water was collected from the *Bisalpureservoir* in 05 liter of sterilized water cane and the testified *Gomeda* was purchased from the authorized merchant. There are significant changes seen in physical, chemical parameters after the treatment of raw water with *Gomeda*. It is concluded that the worked on physical parameters of water.

Key Words: *Gomeda*, *Kalusha*, Purification, Water

Introduction:

Water intended for human consumption should be both safe and wholesome¹. Water is termed as safe and wholesome when it fulfills the physical, chemical and biological parameters, that is physically it should be colorless, odorless, tasteless, Chemically devoid of toxic chemicals and biologically free from the all sort of pathogens. Safe drinking-water does not have any significant risk to health over a lifetime of consumption, including different sensitivities that may occur between life stages. Water is very well discussed in *Ayurvedic* literature. In *Ayurvedic* literature water is called *jeevan* (life) because the potable drinking water is base of life. According to ancient *Ayurvedic* literature all *Dravyas* are *Panchmahabhautika*. *Acharyas* said that water is *Panchmahabhautika* and it is made up of *Agnitvatva*. They called the water *aap* which means present everywhere². It is *Sheeta*(cold), *Shivam* (beneficial), *Vimalam* (clear) and *ruchikarka*. It relieves *Daha*, *Bhrama*, *Moha*, *Alasya*, *Visha*, *Truptikara*, provides *Buddhi*, *Bala*, *Veerya*, *Tushti*, *Pushti* to debilitated the parts of the body³. Water is wholesome because it has all the six tastes. The six tastes are *Madhura*, *Amla*, *Lavana*, *Katu*, *Tikta* and *Kashaya*. In *Ayurvedic* literature, different types of water explained based on place of origin and availability. Quality of water of different rivers is also explained. Various sources and types of contamination of water are described in detail in the traditional texts. Impure water was known as '*Kalusha*' water. Contaminated water is water which is dirty, mixed with slush, algae, weeds and leaves, not exposed to sunlight and wind, thick, heavy, frothy, contains worms and is

a mixture of old and fresh water etc. *Ayurveda* described the methods to identify the impure water and suggests many techniques such as *SaptaKalushaPrasadanDravya*⁴ to enhance the quality of drinking water.

Need of Study:

In developing countries water quality remains the major concern. In this case, scarcity results when either the physical quantity of water is low or the quality of existing water resources is unfit for human use. It is estimated that 1.1 billion people worldwide do not have access to an improved water supply, and many more drink unsafe, contaminated water from improved sources⁵. Various methods are used to purify the water in household ranging from domestic filters like RO system, Katadyn water filters, Pasteur Chamberland filter, Berkefeld water filter to microfiltration. But debate is still ongoing on the usage of water from such purification technique.

In today era, it is time to look over the natural ancient concept which purified the water thousand years ago. *Ayurveda* especially *Sushruta Samhita* emphasize the various methods of purification of water on the basis of the amount of contamination. Severely contaminated water should be purified from the method of boiling, moderately contaminated from quenching the hot earthen gold, silver ball in water and mildly contaminated by exposing to sunlight and by sieving through cloths⁶. Till today, herbs such as bark of *Caesalpiniasappan L.* and seeds of *Cuminumcuminum (jeera)* is routinely added to drinking water as a part of their local health tradition in the state of Kerala.

So, here is an attempt to assess the effect of *KalushaPrasadanDravyaw.s.r.* to *Gomeda* in purification of water.

Aims and Objectives:

1. Determine the role of *KalushaPrasadanDravyaW.S.R.* to *Gomedain* purification of drinking water and yielding the potable water by analytical study.

Review of *Gomeda*:

It is a kind of quartz of a yellowish red color. A *Gomeda* (literally, cow’s fat) is so called simply because it resembles beef’s tallow in color. This stone is reddish yellow in color⁷.

Properties of Highly Excellent *Gomeda*:

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Such a *Gomeda* is heavy, brilliant, white, appearing to be smeared with oily substance, soft, or very ancient (i.e., one which was metamorphosed long ago into its present state, from the state of a quartz), and transparent. Such a zircon is a giver of wealth and fortune to its wearer.

Physical Properties of Zircon⁸

- Chemical classification – Silicate
- Color – mainly yellow, brown and red
- Hardness – 7.5
- Specific gravity- 4.5- 4.6
- Diagnostic properties – hardness, luster, specific gravity

Material and Methodology:

This study was meant to assess the efficacy of *Gomeda* which is mentioned under *SaptaKalushaPrasadanDravya* for purification of water in *Sushruta Samhita*. Before conducting the study, the procedure which to be followed was confirmed. A new study was designed and *Gomedawas* immersed in water for 12 hours and then

changes in water was analyze by testing the water sample in Water Testing Unit.

Material Used:

1 Liter of Raw / Untreated water – *Bisalpurreservoir*, Jaipur

1 Liter capacity sterilized glass pot
Gomeda: -The testified *Gomeda* was purchased from the authorized merchant

- Exact Weight of *Dravya* for purification of specific amount of water was nowhere mentioned in Ayurveda classics.
- The immersion time of *Gomedain* water was not mentioned in classics text.
- Suitable *Patra* was not mentioned in which the purification process take place.
- 5 carat *Gomeda*of lowest quality that is *hassonite* was used in this study because this study was done to assess the effect of *Gomeda* in purification of water which is cost effective for the common people.
- Waiting Period: 12 hours

Potable Water Quality assessment is according to BIS/ISO

Physical parameters

Color, Odor, Taste, Turbidity, Total dissolved solids, pH

Chemical parameters

Antimony, Arsenic, Barium, Boron, Cadmium, Chromium, Copper, Fluoride, Lead, Manganese, Mercury, Nickel, Nitrate (NO3), Nitrite (NO2), Selenium

Biological Parameters

Total bacteria count, E. coli

Methodology:

The raw water from the *Bisalpur* reservoir collected in a five-liter sterilized glass jar. According to the norms of the water testing unit, minimum water sample accepted for the testing is 1 liter. The one liter of water from the jar put in one-liter glass pot and the glasspotkept in a room where direct sun light and wind could not reach to the glass pot. Then the 5 carats of *Gomedawas* immersed in glass pot for 12 hours. Then One liter untreated and *Gomedatreated* water was sent to Water Testing Unit, Jaipur to analyze physical,

chemical and Biological parameters before and after treatment of water.

Result and Observation:

After the treatment of raw water with *Gomeda*, there was no change in Bacteriological Quality of water. Before and after treatment of water, the bacteria were present in water. After the treatment significant changes seen in physical and chemical parameters of water. Sample No.1 and 2 shows the different value of parameters in Table No.1 and 2of raw water and treated water respectively.

Table:1- Bacteriological Quality of Drinking Water Before and After Treatment with *Gomeda*

Sr. No	Test	WA S: Clause	Observed Value		Specific Requirements	Test Protocol
			Sample 1	Sample 2		
1.	Total Coliform in per 100 ml	4.1	Present	Present	Absent	WAS 1622:1981 (RA-1996)
2.	<i>Escherichia Coli</i> in per 100 ml	4.1	Present	Present	Absent	WAS 1622:1981 (RA-1996)

Table:2- Change in Physical & Chemical Parameters of Drinking Water After Treatment with *Gomeda*

Sr. No	Test	WA S: Clause	Observed Value		Specific Requirements (Acceptable Limit)	Test Protocol
			Sample 1	Sample 2		
1.	Colour, Hazen units	4.0	2	2	5.0 max.	WAS: 3025(part-4)
2.	Odour	4.0	Agreeable	Agreeable	Agreeable	WAS: 3025(part-5)

3.	Turbidity, NTU	4.0	0.4	0.1	1.0 max.	WAS: 3025(part-10)
4.	pH	4.0	7.70	7.60	6.5 to 8.5	WAS: 3025(part-11)
5.	Total Dissolved Solids, mg/l	4.0	228	210	500 max.	WAS: 3025(part-16)
6.	Manganese (as Mn), mg/l	4.0	<0.01	<0.01	0.10 max.	WAS: 3025(part-59)
7.	Barium. (as Ba), mg/l	4.0	<0.01	<0.01	0.7 max.	WAS: 3025(pt-2)
8.	Nitrate, (as NO ₃), mg/l	4.0	0.31	1.91	45 max.	WAS: 3025(pt-34)
9.	Nitrite, (as NO ₂), mg/l	4.0	<0.01	<0.01	0.02 max.	WAS: 3025(pt-34)
10.	Fluoride (as F), mg/l	4.0	0.33	0.20	1.0 max.	WAS: 3025(pt-60)
11.	Copper (as Cu), mg/l	4.0	0.01	0.01	0.05 max.	WAS: 3025(part-42)
12.	Selenium (as Se), mg/l	4.0	<0.01	<0.01	0.01 max.	WAS: 3025(pt-56)
13.	Iron (as Fe), mg/l	4.0	0.01	0.01	0.3 max.	WAS: 3025(part-53)
14.	Antimony (as Sb), mg/l	4.0	<0.005	<0.005	0.005 max.	WAS: 3025(pt-2)
15.	Borates (as B), mg/l	4.0	0.05	0.04	5.0 max.	WAS: 3025(pt-2)
16.	Mercury (as Hg), mg/l	4.0	<0.0005	<0.0005	0.001 max.	WAS: 3025(pt-48)
17.	Cadmium (as Cd), mg/l	4.0	0.002	0.001	0.003 max.	WAS: 3025(pt-41)
18.	Arsenic (as As), mg/l	4.0	<0.01	<0.01	0.01 max.	WAS: 3025(pt-37)
19.	Chromium (as Cr), mg/l	4.0	<0.01	<0.01	0.05 max.	WAS: 3025(pt-2)
20.	Lead (as Pb), mg/l	4.0	<0.01	<0.01	0.01 max.	WAS: 3025(pt-47)
21.	Nickel (as Ni), mg/l	4.0	0.01	0.01	0.02 max.	WAS: 3025(pt-2)

Discussion:

The *Gomeda* used in this study was hessonite that of lowest cost. This kind of *Gomeda* used because of *Jal Prasadani Vidhi* was expected to be cost effective.

Although this type of *Gomeda* also has some effect on different parameters. It lowered some water pollutants like TDS, pH, turbidity in some extent but this action of *Gomeda* is difficult to explain how it

works. There is no direct evidence available for the relation of *Gomeda* with physical and chemical parameters. If *Gomeda* that is use in water purification of higher quality results may vary.

If we think according to ayurvedic point of view, *Gomeda* possess *laghuguna*. According to *Panchmahabhuta*, the *Aakash* and *VayuMahabhuta* are present in *LaghuGuna*. Hence by staying in the supernatant part of water and by sedimenting solid particles, total dissolved solids reduced in water.

As per classics *Gomeda* possesses properties of *RukshaGuna*. By virtue of its

Ruksha its action on lowering turbidity can be explained through *SoshanKarma*.

Conclusion:

After the treatment of raw water with *Gomeda*, we can conclude that:

- There was change in TDS, turbidity, pH, barium, nitrate, cadmium, fluoride and there was no change in odor, color, manganese, selenium, iron, nitrite, lead, chromium antimony, borates, nickel, mercury, arsenic.
- It decreased the value of TDS, pH, turbidity, borates, cadmium, fluoride.

Finally, it is concluded that the *KalushyaPrasadanDravya* mainly *Gomeda* worked on physical parameters of water.

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