

**COMBATING WATER POLLUTION: INSIGHTS FROM AYURVEDA AND MODERN SCIENCE****Vaibhav Narwade\*<sup>1</sup>, Ritu Kapoor<sup>2</sup>, Manoj Adlakha<sup>3</sup>, Kiran Kamaliya<sup>4</sup>, Anisha Jain<sup>5</sup>**<sup>1</sup>Post Graduate Scholar, P.G. Department of Agad Tantra, PGIA, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, India.<sup>2</sup>H.O.D. & Professor, P.G. Department of Agad Tantra, PGIA, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, India.<sup>3</sup>Associate Professor, Department of Dravya Guna, PGIA, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, India.<sup>4</sup>Post Graduate Scholar, P.G. Department of Agad Tantra, PGIA, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, India.<sup>5</sup>Post Graduate Scholar, P.G. Department of Agad Tantra, PGIA, Dr. S. R. Rajasthan Ayurved University, Jodhpur, Rajasthan, India.**\*Corresponding Author: Vaibhav Narwade**

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**ABSTRACT**

The ancient Indian classics, such as the Sushruta Samhita, Charaka Samhita, and Astanga Hridaya have examined the problems of water pollution, including its sources, effects, and effects on the body and universe. They have also examined ways to prevent water pollution and purify contaminated water. The problem of water pollution, its detrimental effects on the environment, community, and health, as well as the steps to purify it, were anticipated by India's great sages even thousands of years ago. The majority of these natural purifying techniques are still unexplored by researchers. A combination of one or more of these measures when applied in a systematic manner can sometimes be more effective than the most advanced chemical methods of purification. The goal is to fully investigate and uncover this comprehensive science and all of its richness.

**KEYWORDS:** water pollution, water purification, natural herbs, water born disease.**INTRODUCTION**

Water is vital for life on Earth, covering over 75% of the planet's surface. Maintaining the purity of water is crucial for both socioeconomic growth and the sustainability of life. According to the World Health Organization, approximately 829,000 people die annually from diarrhea due to contaminated drinking water and poor hygiene practices. Environmental catastrophes, such as floods and tsunamis, and waterborne diseases, like malaria and lymphatic filariasis, further exacerbate the impact of water pollution. According to Ayurveda water is considered as one among the Panchamahabhootas and Prana(life) of the entire universe. In Ayurveda, water pollution is seen as a significant disruptor of health and balance.

**Causes of Water Pollution**

Sewage from homes and businesses, agricultural pollutants such as pesticides, fertilisers, manures, and animal waste, spilt oil, radioactive material pollution, and river dumping are the main causes of water pollution. Macroscopic materials like plastic, paper, and food waste, inorganic materials like heavy metals, ammonia, nitrates, and sulphates, and thermal pollutants like wastes from atomic, thermal, and nuclear power plants are the general categories into which they can be divided. Organic materials include detergents, insecticides, and herbicides.

**Health Complications**

Vomiting, diarrhea, anemia, appetite loss, liver and kidney dysfunction, hepatitis A and hepatitis E, typhoid-

like fevers, gastrointestinal tract difficulties, skin disorders, and metal poisoning are the main complications brought on by water pollution.

### Water Cleansing from a Contemporary Standpoint

Modern methods of water pollution prevention encompass various techniques. Chemical disinfection, using agents like chlorine, effectively kills pathogens. Mechanical filtration, employing rapid sand filters, physically removes contaminants. Biological filtration utilizes slow sand filters where microbial action purifies water. Additionally, preventive storage is essential, ensuring water is properly stored to avert future contamination. These combined approaches provide comprehensive solutions to maintain water purity.

### Ayurveda's perspective on water pollution

In ayurveda, water is thought to be the element that gives life to all living things. Decomposed aquatic animal corpses, decomposed plants, water exposed to the sun, moon, and air, as well as the growth of microorganisms and water when combined with rainfall, can all cause water to become contaminated. Smell, taste, consistency, odour, and chemical transformation should all be used to determine the potency and quality of water.

**Signs of vitiated water** according to acharya sushruta contaminated water surface will have blackish lines and a foamy, slimy, and strongly scented appearance. Aquatic creatures perish for no apparent reason. The wildlife surrounding the contaminated water source may appear confused. When humans or animals bathe in it, they may experience heat, burning sensations, limb swelling, vomiting, and fainting or delusions. Adhmana (flatulence), udaravyadhi (gastrointestinal disorders), jwara (fever), kasa (cough), kshutmandya (loss of appetite), grandhi (tumours, nodular enlargements, and goitre), angagaurava (heaviness), udarasoola (abdominal pain), koshtabaddhata (constipation), sotha (swelling), pandu (anaemia), ajeerna (indigestion), swasa (respiratory distress), pratisyaya (rhinitis), kushta (skin diseases), kandu (itching), and netrabhishyanda (conjunctivitis) can all be caused by drinking contaminated water.

### Techniques for water purification in ayurveda –

Several Ayurveda text have been mentioned a number of methods for purifying water. The water can be made clear and pure by adding ashes of medications such as dhava (*Anogeissus latifolia*), aswakarna (*Dipterocarpus alatus*), patala (*Stereospermum suaveolens*), paribhadra (*Erythrina variegata*), asana (*Pterocarpus marsupium*), nigundi (*Vitex negundo*), mokshaka (*Schrebera swietenoides*), karnikaraka (*Cassia fistula*), and somavalka (*Acacia leucorrhoea*). It is said that water can be purified by impregnating it with kataka (*Strychnos potatorum*), gomeda (hessonite), visagranthi (lotus roots), shaivalamoola (algal root), vastra (cloth), mukta (pearl), mani (potash alum), parnimula (a type of grass

that has the ability to dilute water), and heating, exposing to sunlight, and submerging hot iron balls.

Nagakesara (*Messua ferrea L.*), champaka (*Michelia champaka L.*), utpala (*Nymphaea sellata Willd.*), patala (*Stereospermum suaveolens DC.*), and karavira (*Nerium indicum Mill*) flowers are recommended to eliminate the odour of vitiated water. It is recommended that water be kept in vessels made of valuable stones, bell metal, copper, silver, or gold. According to certain health benefits, storing water in a copper jar overnight contains lekhana properties, which aid in healing and nourishing. The water mentioned in sharad ritu, hamsodaka, which is made by exposing it to sunshine and moonlight, has the qualities of rasayana (rejuvenating), balya (strengthening), medhya (promotes intellect), tridoshahara, and anabhishyandi (doesn't clog channels of circulation).

### Current research on Ayurvedic water purification techniques

According to a study on the effects of preserving drinking water in copper pots, the bacteria that causes diarrhoea is killed. Copper surfaces killed *E. coli* entirely; even after enrichment culture, none of them were found. Using the spread plate method, Kirby Bauer disc diffusion method, most probable number method, and petrifilm method, another study on the antibacterial effect of natural herbs in water treatment against total coliform, faecal coliform, and *E. coli* found that krishna thulsi (*Ocimum sanctum Linn.*), karpooora thulsi (*Ocimum kilimandscharium Guerke*), neem (*Azadirachta indica A. Juss.*), and asoka (*Saraca indica Linn.*) had the most effective antibacterial activity. Gomeda has a major impact on water pollutants, according to another study. It was discovered that the jalanirvishikarana yoga that Vagbhata had stated had effective antibacterial activity and lasted for at least a year at room temperature. *Phyllanthus emblica* was found to lower overall hardness, pH, magnesium, and sulphate levels in another investigation on the plant's ability to filter water. Additionally, the addition of *Phyllanthus emblica* to water resulted in a significant decrease in *E. coli*, faecal coliforms, and total coliforms.

### DISCUSSION

Water, considered a vital element in both Ayurveda and modern science, plays a critical role in sustaining life on Earth. The introduction highlights the significance of water purity and the consequences of water pollution, which include severe health issues and environmental disasters. The modern approach to water purification involves chemical disinfection, mechanical filtration, and preventive storage. Ayurveda also recognizes the importance of water purity, identifying natural contaminants and providing traditional purification methods, such as using plant-based ashes, heating, and storing water in specific materials. Recent studies support the effectiveness of Ayurvedic methods in reducing bacterial contamination and improving water quality.

**CONCLUSION**

Both modern and Ayurvedic perspectives emphasize the necessity of maintaining clean water to prevent health hazards and environmental problems. Combining these methods could provide comprehensive solutions for water purification, ensuring the well-being of communities worldwide. Integrating traditional Ayurvedic wisdom with contemporary scientific practices can enhance the effectiveness of water purification strategies, making them more sustainable and accessible.

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