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AN AYURVEDIC PERSPECTIVE ON THE ROLE OF STORAGE VESSELS IN MAINTAINING DRINKING WATER QUALITY

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ABSTRACT

Access to safe drinking water remains a major challenge in many developing countries. While the purification of water is essential, the method of its storage plays an equally important role in maintaining its quality. The practice of storing water in vessels made of metals such as gold, silver, and copper, or in earthen pots, dates back to ancient times. Interestingly, modern scientific studies have confirmed that certain metals like copper and silver can release trace elements into stored water, enhancing its -microbiological and chemical quality a concept that aligns closely with Ayurvedic principles. In Ayurveda, the influence of the storage vessel on water quality is described under the concept of Samskara (modification or processing). Sushruta Samhita specifically mentions the use of copper and silver vessels for storing drinking water to promote health and prevent disease. Traditional wisdom also cautions against materials that may have harmful effects - a concern that is increasingly relevant today with the widespread use of plastic containers. Studies have shown that leaching from plastics and some metals, when exceeding the limits prescribed by the World Health Organization (WHO), can introduce toxic substances into the body. This review explores the Ayurvedic understanding of water storage, examines classical references regarding the use of different vessels, and critically analyzes modern research related to water quality, metal leaching, and potential health impacts. The study highlights how ancient Ayurvedic practices of water storage remain scientifically relevant and beneficial in promoting safe drinking water in modern times.

INTRODUCTION

In Ayurveda, environment (Ayushya Parivesha) is regarded as an important external factor that profoundly influences human health. From an ecological perspective, health is a state of dynamic balance between an individual and the surrounding environment. When this balance is disturbed, disease and ill health arise. In India, a large proportion of communicable diseases are linked to poor sanitation and unsafe water.

Water (Jala) is one of the most essential components of the environment, influencing health both directly and indirectly. It plays a crucial role in digestion, excretion, temperature regulation, and overall physiological balance. Indirectly, however, contaminated water acts as a medium for the transmission of many communicable diseases such as typhoid, viral hepatitis A, poliomyelitis, and diarrhea.[1] Hence, water intended for drinking must be safe, clean, and wholesome.

Recognizing this, the World Health Assembly emphasized that access to safe drinking water is a fundamental component of Primary Health Care. Drinking water must be free from contamination and available in adequate quantity. According to the World Health Organization (WHO), waterborne diseases contribute to nearly 3.6% of the global disease burden (measured in disability-adjusted life years) and are responsible for approximately 1.5 million deaths annually. Globally, around 80% of diseases are waterborne, and alarmingly, groundwater in nearly one-third of India's 600 districts is considered unsafe for human consumption.[2]

Ayurveda, the ancient science of life, emphasizes both the prevention and treatment of diseases.[3] Classical Ayurvedic texts describe various sources of water, their properties, purification methods, and guidelines to ensure water safety. These ancient procedures were preventive in nature and aimed at maintaining health through environmental hygiene.

In Ayurveda, the quality of food and drink is influenced by several factors. The concept of Ashta Ahara Vidhi Visheshayatana (eight factors determining the quality of food) explains how the properties of food are affected by factors such as its nature (Prakriti), processing (Karana), combination (Samyoga), quantity (Rasi), place of origin (Desha), time (Kala), consumption rules (Upayogasamstha), and the individual consuming it (Upayokta).[4][5]

Among these, Karana—which includes processes like heating, mixing, cleaning, and

storing—is also known as Samskara, meaning transformation of inherent qualities.

Bhajana (the storage vessel) is one of the key Samskara factors that helps preserve or alter the quality of food and water.[6] Classical Ayurvedic texts mention specific materials recommended for cooking and storage, including those suitable for storing drinking water. The type of vessel—whether copper, silver, gold, earthen, or otherwise—can significantly influence the quality and safety of the stored water.

The present review aims to explore the Ayurvedic concept of water storage, examine the role of various traditional vessels in maintaining water purity, and highlight their relevance in promoting health and preventing disease in the modern context.

METHODOLOGY

Literary references were collected from Ayurveda classics, commentaries, modern literatures, research journals available in institute library, online portals like Pubmed central, Ayush research portal, Google scholar, E-books and analyzed to frame conceptual work.

Storage Vessels in the Ancient Era

Acharya Sushruta has described simple yet effective methods for storing water to make it safe and wholesome for drinking. According to him, water kept in vessels made of various materials such as Souvarna (gold), Rajat (silver), Tamra (copper), Kanshya (bronze), Mani (precious stones), and Mrittika Patra (earthen pots), or water infused with fragrant flowers, is ideal for consumption.[7]

Among these, Tamra Jalapatra (copper vessel) is considered Uttama—the best choice for storing drinking water—due to its purifying and health-promoting qualities. In the absence of a copper vessel, water stored in a Mrittika Patra (earthen pot) is recommended, as it is Hitakari (beneficial) for health.[8]

Other classical Ayurvedic texts also mention various types of vessels for water storage, each imparting distinct qualities to the water depending on the material used. These recommendations by the ancient Acharyas were not arbitrary but the result of long-term observation, experience, and a deep understanding of the interaction between natural materials and human health.

Table 1: Qualities of Storage Container of Water.[9]

Different types of vessels	Qualities of water
Hema/Souvarna (gold) *Bhajana*	*Suswadu* (sweet) *Vipaka*, *Sheetala* (cold in potency), *Laghu* (light), *Tridosha samana* (balances all three *Doshas*), *Virya-Bala- Medhakara* (improves fertility, immunity, intelligence), *Subha* (auspicious)
Trapusa (tin) *Bhajana*	*Picchila* (sticky), *Madhura rasa* (sweet taste), *Kaphakara* (increases *Kapha dosha*), *Sheeta* (coolant), *Agni vardhana* (improves digestion), *Malakara* (increases the bulk of faeces and urine), *Vata vardhana* (increases *Vata dosha*)
Tamra (copper) *Bhajana*	*Ushna Virya* (hot in potency), *Swadu* (sweet), *Katu Rasa* (pungent in taste), *Katu Vipaka* (pungent in potency), *Pittaanilaprada* (vitiates *Pitta* & stimulates digestive fire), *Sakritmarutanasana* (decreases quantity of faeces and flatus)
Ghosa (bell-metal) *Bhajana*	*Usna Vipaka* (hot in potency), *Katu* (pungent), *Guru* (heavy to digest), *Pittasleshmaprada* (aggravates *Pitta* & *Sleshma dosha*), *Marutanasanam* (destroy *Vata dosha*)
Pittala/ Rittika (brass) *Bhajana*	*Katu rasa* (pungent in taste), *Sleshma piita vinasha* (reduces *Kapha* & *Pitta dosha*), *Usna* (hot in potency), *Meharoga vivardhanam* (causes progression of *Prameha*)
Louha (iron) *Bhajana*	*Atyanta ruksha* (very dry), *Raktapittahara* (treats bleeding disorders), *Kanduhara* (reduces itching), *Tridoshasamana* (vitiations of all three *Doshas*)

Table 2: Qualities of Heated Water in Different Vessels.[10]

Water heated in particular vessels	Properties
Louhabhajana santaptam (heated in iron vessel)	*Mandagnikara* (diminished *Agni*), *Malanam Rechana* (purges the *Malas*), *Amashaya Kshalana* (cleanses stomach)
Madhudumbarabhajana taptitam (heated over the vessel prepared from the wood of *Udumbara*)	*Uttam* (ideal for body), *Bapukantiprada* (increases lustre of body), *Pittakara* (alleviates *Pitta*)
Mrittkabhajana taptam (heated over an earthen vessel)	*Malakshalana* (cleanse out waste products), *Hitam* (wholesome), *Dhatu Satmya* (wholesome for tissues of the body), *Virya-BalaOja-Parivardhanam* (promotes vitality, strength & vitality)

RESULT AND DISCUSSION

Acharya Sushruta described six types of vessels used in ancient times for storing drinking water — those made of gold, silver, copper, bronze, precious stones, and clay. The choice of vessel depended largely on a person's financial status and social position. People of that era intuitively understood the importance of storing water properly to maintain its purity and safety.

From a modern scientific perspective, when water is stored in metal containers, small

amounts of metal ions dissolve into the water. These ions possess antimicrobial properties that help eliminate harmful microorganisms — a phenomenon known as the oligodynamic effect.[11] This effect refers to the ability of certain metals to exert a toxic influence on bacteria, fungi, algae, and other microorganisms, even at very low concentrations.

Although ancient people had no knowledge of microbes or modern microbiology, they were evidently conscious of hygiene, water safety, and the prevention of water-borne diseases.

Among the metals, as per ayurveda copper is particularly noteworth.[12] Modern research confirms that copper ions released in water can effectively destroy pathogenic bacteria, making it a scientifically validated practice to store drinking water in copper vessels.

Safe and clean drinking water plays a vital role in preventing many diseases. Ancient Ayurvedic classics emphasize the importance of water quality and its influence on health. They describe that water with Tikta (bitter) and Kashaya (astringent) tastes acts as Deepaniya (appetizer), Lekhaniya (removes unwanted fat and toxins), Pittakapha Shamak (balances Pitta and Kapha doshas), and Rechaka (mild laxative). Such water is said to help prevent conditions like Krimi (intestinal worms), Pandu Roga (anemia), Shoola (abdominal pain), Amlapitta (acidity), Jwara (fever), and Daha (burning sensation). Its Lekhaniya and Ropana (healing) properties also support wound healing (Vrana), and are beneficial in Shotha (inflammation) and Kustha (skin diseases).[13]

Similarly, Madhura Rasa (sweet taste) is known to nourish body tissues (Tarpaniya), promote vitality (Jeevaniya), and counter tissue depletion (Kshaya). Because of its Kaphavardhaka and Vatapittahara nature, it helps alleviate poisoning (Visha), burning sensations, and excessive acidity. Water with Amla Rasa (sour taste) improves digestive strength and metabolism.[14]

Modern studies support that storing water in copper or stainless steel vessels enhances its quality and safety.[15] Laboratory experiments have demonstrated that copper surfaces can destroy harmful microorganisms such as Staphylococcus aureus (including MRSA strains), Salmonella enterica, and Escherichia coli across various pH levels. Copper exhibits strong antibacterial activity even in neutral water (around pH 7.8). Some studies also show that storing water in copper vessels does not significantly alter its physicochemical parameters, confirming it is safe for daily use.[16]

Ancient texts and recent scientific findings agree that storing water in copper vessels purifies it, making it safer to drink. Copper not only kills harmful bacteria but is also believed to delay aging due to its antioxidant properties.[17] Traditionally, it is recommended to store water in a copper pot overnight and drink it the next morning. Research further supports that copper is more effective in killing coliform bacteria[18] compared to other metals like aluminum or stainless steel.[19] However, studies also reveal that silver possesses even stronger antibacterial properties against both gram-positive and gram-negative bacteria.[20]

While copper is beneficial, excessive amounts in drinking water can be harmful. Research from Europe and the USA indicates that copper concentrations in water can range from less than 0.005 mg/L to more than 30 mg/L, highlighting the need for moderation and further study.[21]

In contrast, the widespread use of plastic containers for storing food and water poses serious health and environmental risks. Plastics, especially those containing BPA (Bisphenol A) or PVC (Polyvinyl Chloride), release toxic chemicals that can disrupt hormonal balance, reduce testosterone levels, and contribute to conditions such as obesity, diabetes, infertility, and even cancer. They are also non-biodegradable, making them harmful to both human health and the environment.[22]

Earthen or clay pots offer a natural and healthier alternative. Their porous structure cools the water through evaporation, providing a pleasant, soothing temperature ideal even for those with throat infections or cough. The slight alkalinity of clay water balances the body's pH, helping reduce acidity and digestive issues.[23] Studies show that water stored in clay pots retains its minerals and vitamins, and microbial counts are significantly lower due to the cooling effect.[24]

Overall, research suggests that traditional storage vessels such as copper, brass, silver, and clay pots are effective, low-cost, and eco-friendly options for maintaining safe and pure drinking water.[25] These ancient practices, supported by modern science, reflect the deep wisdom of Ayurveda in promoting health through simple yet powerful daily habits.

Ayurvedic literature also regards Tamra (copper) as the best material for storing drinking water because of its purifying properties. Classical Ayurvedic texts describe copper as capable of maintaining water purity and promoting good health. Recent scientific studies

further support these ancient insights, demonstrating that water stored in copper vessels is microbiologically safer and beneficial for regular consumption.[26]

CONCLUSION

The type of container used for storing water has a significant impact on its purity and overall quality. Understanding the traditional wisdom about the health benefits of natural materials such as copper and clay, along with awareness of the harmful effects of plastics, is essential for maintaining good health. Storing water in safe, natural vessels not only helps prevent various diseases but also supports overall well-being. Therefore, ensuring access to clean, pure, and safely stored drinking water is one of the simplest yet most effective ways to promote a healthy life.

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