

**Review Article**

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## A Literature Review on Drink Water Contamination

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Water is the most important matter of life, the get safe drink water is considered as aright essential to all human. Although the necessity of water for the welfare of human and sustainable development, but sometime water borne diseases are caused death in some parts of the world. The causes of water pollution include a wide range of chemicals and pathogens as well as physical parameters. Contaminants may include organic and inorganic substances. The presence of contaminants in water can lead to adverse health effects, including gastrointestinal illness, reproductive problems, and neurological disorders in infants, young children, pregnant women, the elderly and people whose immune systems are compromised.

### Introduction

Sources of drinking water are subject to contamination and require appropriate treatment to remove disease-causing contaminants. Contamination of drinking water supplies can occur in the source water as well as in the distribution system after water treatment has already occurred. There are many sources of water infection, containing naturally occurring chemicals and reserves (for case, arsenic, radon, uranium), local land use performs (fertilizers, pesticides, focused feeding processes), manufacturing processes, and sewer overflows or wastewater releases. A common reason of thermal pollution is the

consumption of water as a coolant through power plants and developed manufacturers. Elevated water temperatures decrease oxygen levels, which can kill fish and alter food chain composition, reduce species biodiversity, and foster invasion by new thermophile species<sup>(1-3)</sup>.

### Measurements of pollution

Water contamination is dignified through analyzing water testers. Physical, chemical and biological investigations can be done. Control of water contamination requires suitable infrastructure and administration plans. The structure may include wastewater

treatment plants. Sewage treatment plants and industrial wastewater treatment plants are usually required to shield water bodies from untreated wastewater. Agricultural wastewater treatment for farmhouses, and erosion control from building sites can moreover help avoid water pollution.<sup>(3-6)</sup> Current control of urban runoff includes decreasing speed and quantity of flow. In the United States, best management practices for water pollution include approaches to reduce the quantity of water and improve water quality.<sup>[7]</sup>

## **Sampling**

Control group of water to (physical or chemical,...) analysis can be done through numerous approaches, conditional on the accuracy required and the characteristics of the contaminant. Numerous pollution events are sharply controlled in time, most generally in association with rain events.

To this purpose "grab" samples are often inadequate to fully quantifying pollutant levels. Scientists gathering this kind of data often service auto-sampler devices that pump increments of water at either time or discharge intervals.

Sampling to biological testing includes collection of plants and animals from the surface water body. Depending on the kind of assessment, the organisms may be recognized to bio surveys (population counts) and resumed to the water body, or they may be dissected for bioassays to determine toxicity<sup>(7)</sup>.

## **Physical testing**

Public physical investigations of water contain temperature, solids or elements quantities (e.g., total suspended solids (TSS)) with turbidity.

## **Chemical testing**

Water tasters may be inspected and identified through using the principles of analytical chemistry. Numerous published test approaches are available to each organic and inorganic compounds. Frequently used approaches contain pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), nutrients (nitrate and phosphorus compounds), metals (containing copper, zinc, cadmium, lead and mercury), oil and grease, total petroleum hydrocarbons (TPH), and pesticides<sup>(8-10)</sup>.

## **Biological testing**

Biological investigation includes the usage of plant, animal or microbial indicators to monitor the health of an aquatic ecosystem. They are any biological species or collection of species whose purpose, population, or status can reveal what amount of ecosystem or environmental integrity is current. One sample of a group of bio-pointers is the copepods and other small water crustaceans that are present in many water bodies. Like organisms can be observed for deviations (biochemical, physiological, behavioral) that may designate a problem within their ecosystem<sup>(13)</sup>.

## **Sources of contaminants (germs and chemicals)**

There are various causes of contamination of our water systems. Here is a list of the most common sources of contaminants:

Indeed occurring chemicals with minerals (as a sample, arsenic, radon, uranium)

Local land use performs (fertilizers, pesticides, livestock, focused animal feeding processes)

Manufacturing procedures

Sewer excesses

Malfunctioning remaining water treatment methods (as a sample, nearby septic systems)

### **Sources of pollution in public water systems**

*Giardia*

Legionella

Norovirus

Shigella

*Campylobacter*

Copper

Salmonella

Hepatitis A

Cryptosporidium

E. coli, excess fluoride.

A large portion population of world do not get microbiological safe source of drink water and other purposes especially in development countries because of the consumption of contaminated water<sup>(15)</sup>.

The sewage water, agricultural discharge, industrial effluents and industrial waste from fossils fuel plants, chemical industries and unclear power plants are the other chief sources of water pollution, that make a large problem of water pollution rendering water no longer fit for drinking, agriculture and quantic life<sup>(16)</sup>.

The health risk associated with the microbial contamination of drinking water is a major challenge in most population of developing world. The challenge originates from the fact

that water management system are either inadequate or nonexistent<sup>(17-20)</sup>.

Therefore microbial contamination of drink water remains significant threat, especially in developing countries, for example the erratic supply of pipe borne water and shortage of water in the some metropolis for sometimes are make the people depending on commercial water supplies<sup>(20)</sup>. These water supplies may be not good quality and may even contain pathogenic microbes which can cause forms diseases including enteric fever and typhoid. Elderly children and immunocompromised individuals (e.g. those with AIDS) are more susceptible to sewage waste pollution<sup>(21-25)</sup>. The elevated levels of variety of contaminant sources may increase risk of a range of diseases in children, including acute disease such as endocrine disruption, gastrointestinal infection, developmental effects such as learning, disorder and cancer due to children tend to take a lot of water relative to their body Weight than adults do, there for children high exposure to drinking water contaminants Each year 3.4 million people, mostly children, die from water related disease according to world health organization(WHO).<sup>(26-29)</sup>

In surface water, pathogenic microorganisms are reaching rivers along with sewage water. if present in large quantities can be important pathogenic factor causes much discomfort, but if a present in a small quantities will not the threat health's and life's human depending on various factors, the amount of pathogenic microorganisms in river waters varies, these factors such as water level, the size of the stream, degree of eutrophication of the watercourse, the seasonal, and the ability of a watercourse to self-clean its tributaries, or geographical area through which the river flows presence of cattle pesticides and the use of fertilizers the direct causes of water contamination<sup>(30-34)</sup>

The Sewage polluted water contains many viruses, above one hundred species are conveyed and can lead to illnesses that affect human beings. For example, hepatitis, gastroenteritis, meningitis, fever, rash, and conjunctivitis can entirely be spread through contaminated water. More viruses are actually discovered in water because of new detection and description methods, though only some of these viruses are human pathogens<sup>(35-38)</sup> and the indirect causes lack of participation and transparency, unclear administrative boundaries procedures not followed and limited resources. On the other hand, aquatic diseases are made happen by water that is polluted by human and animal urine and feces that encompass pathogenic microorganisms. A matter can get diseased through communication with or consumption of the dirty water<sup>(38)</sup>. Also, study was showed that the rural water was contaminated with *Escherichia coli*, *Enterobacter*, *Pseudomonas*

*aeruginosa*, *Klebsiella* sp, *Proteus vulgaris*, *Bacillus cereus*, *Alcaligenes faecalis*, *Staphylococcus aureus*, *Streptococcus lactis* and *Micrococcus luteum* were identified in samples of drinking water, the presence of some pathogenic bacteria in drinking water may cause and increase the risks of water-related diseases and health problems in local residents<sup>(32-36)</sup>. Contaminated water not merely transmits illness, it is too toxic for the vegetation and animals in the basin.

For example, in the fall of 2018, hundreds of tons of carp packed in floating fish farms that densely line the Euphrates River in the Babylon Province of Iraq. Subsequently conducting water excellence tests, the World Health Organization resolved the river had great levels of bacteria, heavy metals and ammonia (AP, 2018a), entirely signs of contamination from municipal and industrial sources<sup>(38-41)</sup> (Fig. 1-8)

**Fig.1** Environmental pollution



**Fig.2** Chemical pollution



**Fig.3** Biological pollution



**Fig.4** Pollution of Rivers



**Fig.5** Test of bacteria in water samples



**Fig.6** sewage water pollution



**Fig.7** Waste water pollution



**Fig.8** Industrial effluents pollution



**Fig.9** Pollution through types of waste



## Recommendations

Water pollution has negative effects on public health

By paying practicing good personal hygiene, you can protect yourself and others from waterborne illness

Sewage water treatment to remove all the various constituents of the polluting load: solids, carbon, organic, nutrients, inorganic, metals salts, pathogens etc

Before raw sewage water can be safely released back into the environment, more than 80% of the worldwide wastewater goes back in the environment without being treated or reused,. According to the United Nations

Improve plastic waste management and reduce our use of plastic globally

Water is a scarce resource, taking care of it and managing it responsibly

Inspection, cleaning and maintenance that should be done in service reservoirs

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