



## Self-Cleansing and Special Healing Properties of River Ganga: Million People Depend on this Water

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### Abstract

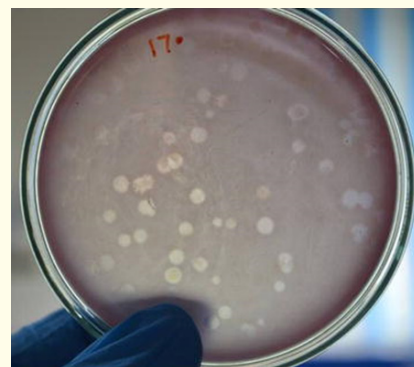
Ganga is known to be a help to a tremendous measure of individuals in India and is known to be the heartbeat of the profound existence of the Hindu culture. Self-purifying and recuperating power have consistently been related with stream Ganga. In any case, of late, logical research has likewise sponsored this case.

**Keywords:** Self-Cleansing; Healing Properties; Ganga; Water

The water of Ganga has shown a fascinating bactericidal action for example the capacity to eliminate microorganisms and as this riddle unfurls it has all the earmarks of being identified with bacteriophages. These are the troopers that eliminate microscopic organisms by contaminating them and subsequently should give an extremely valuable option in contrast to anti-infection agents as phage treatment. Conduit Ganges in India, for an impressive period of time, has been revered for its “self-cleansing and unprecedented retouching properties”.

In excess of 450 million individuals rely upon the waters of Ganges for some parts of their life. In 1896, one of the principal distributed chips away at Ganges water by Ernst Hankin, a British bacteriologist exhibited antibacterial property of Ganges water against *Vibrio cholera* [1]. Further work by French microbiologist D’Herelles in the start of the twentieth century built up that the antibacterial property of Ganges water to be because of a factor, later named “bacteriophage” [2]. The above said contemplates were directed during the time of Crown rule in India and a noteworthy number of establishing concentrates on Ganges were done for the most part by British and French microbiologists. Such investigations on Ganges prompted the acquaintance of bacteriophages with the world. Bacteriophages are the prokaryotic infections that exclusively contaminate or potentially pulverize the microscopic organisms. Bacteriophages were related with the exceptional property of stream Ganges [1,2].

A significant perspective identified with these phages is that they are basically innocuous to people as they are profoundly strain-explicit. For e.g. We should consider microscopic organisms that causes Cholera '*Vibrio cholerae*' the phage that will murder this hazardous bacterium will be explicit to it and won't be compelling towards some other cells and the most noticeable thing about these phages is that they frequently target microbes that are answerable for causing savage ailments. Abnormally, our assessment in light of the fact that has demonstrated the proximity of bacteriophages against putrefying and pathogenic infinitesimal life forms in the waters of Ganges even at its beginning stage (Figure 1). The beginning stage of conduit Ganges is known as Gomukh.



**Figure 1:** Plate of phages isolated against bacteria-*Escherichia* spp. at Gomukh's melting permafrost. Plaque assay-clear plaques due to bacteriophage mediated bacterial cell lysis are visible.

Geographical investigations have demonstrated that the Himalayas had risen at a site where the Tethys Ocean once existed, because of impact between the Indian and Eurasian structural plates. Thus, Himalayas' marine birthplace is known and it has been interesting to discover marine fossils high in the Himalayas [3].

The waterway has been demonstrated to have antibacterial properties and one of its verifications is that it can hold high measures of Dissolved oxygen in gigantic contaminated conditions too. This intriguing bactericidal property of Ganges water was being discovered first by the British bacteriologist Ernest Hankin in 1896. He found that settlements of cholera microscopic organisms which flourish in faucet water they rapidly bite the dust on experiencing Ganges water. He further contemplated this marvel by bubbling one example of Ganges water and sifting another example of Ganga. The discoveries were surprising as the separated one kept on indicating an antibacterial impact while the bubbled one didn't. This inferred the factor answerable for the antibacterial properties of Ganges was heat-labile.

After right around two decades, a Canadian microbiologist named Felix d'Herelle was working at the Institute Pasteur in Paris in 1916 and he found and clarified the structure of Phages which are made out of proteins as an external envelope with hereditary material inside it. They additionally have properties like being heat-labile which compare superbly to the Hankin's discoveries.

Stunning!! Self-purging and self-recuperating are a motivational property of Ganges, isn't it! Thus, there is no Hindu custom that is finished without the utilization of Ganga Jal. It is perhaps the best case of freshwater environments with its inception from Gangotri (Uttaranchal) and covering around 2525 km before it meets the Indian sea and this gathering place is known as Ganga Sagar (W.B.).

Be that as it may, lamentably, this image of immaculateness is been disrespected by dismissed and juvenile exercises of Humans. Much the same as here and there when we neglect to value our mom's unqualified love similarly, we are misusing the unlimited love given by the Ganges to us by abusing and contaminating it. The figures identified with the contamination brought about by Humans are upsetting however can't be overlooked. Like the investigations completed with the assistance of the sponsorship given by the World Bank and its cooperation with the U.P. government have discovered that around 9 - 12% of the all-out sickness caused in UP is contributed by drinking Ganges water.

The explanation is the coliform bacterial thickness which is in overabundance in around 2 lakh MPN as against the national wa-

ter quality standard of 5000. Coliform nearness means that fecal contamination... and we are discussing its essence in the drinking water which is exceptionally disturbing. In the Central Pollution Control Board (CPCB) overview report distributed in 1985, it was discovered that around 1340 million liters of sewage delivered every day from around 25 towns living on the bank of Ganges was negligently pouring in the heavenly water.

Aside from sewage squander, modern waste, and around 6 million tons of composts and 9000 tons of pesticides conveyed alongside overflows, a gigantic amount of strong waste including a great many creature bodies and human cadaver are discharged in the waterway consistently. As for a report introduced by CPCB, to National Green Tribunal (NGT) in August 2018, around as meager as five out of 70-odd checking stations had water that is fit for drinking and very nearly seven of them are fit for washing.

How might we expect bacteriophage alone to manage this colossal decent variety of poisons delivered by Humans each and every day?

As there are neglectful individuals who are focused on contaminating our Ganga there are mindful individuals who are focused on battling this stream contamination - Ganga Purification. One such worldwide family made for this reason for existing is Ganga Action Parivar (GAP) which is committed to tidying up stream Ganga and furthermore to manage issues identified with it. Hole work incorporates an immense plenty of administrations extending from strong waste administration to wastewater the board and mindfulness in regards to training with a dream of cleaning stream Ganga.

In India, the vast majority of the city wastewater treatment plants use essential and auxiliary treatment advances. Essential treatment is used to expel squander like coarseness, plastic sacks, trash, bigger particles, oil, and oil by utilizing either the moving or fixed bar screens. While optional treatment innovations used the organic procedures identified with biofilm, floatation, characteristic or constrained air circulation, explanation and gravity settlement advancements. These are a portion of the methods which are utilized by GAP to clean Ganga.

In another intriguing exploration completed by Dr. Asha Lata Singh, partner teacher of Environmental Science at the Department of Botany, BHU was tied in with utilizing agreeable microscopic organisms to expel lethal poisons from out national waterway Ganga. Her examination was focused on the utilization of bacterial populace which takes care of and duplicates on poisons to be utilized for building up an organism based purging method. For this methodol-

ogy, these microscopic organisms first should be separated from other present water of Ganga developed and afterward discharged.

This splendid strategy dependent on microbial purging strategies can be partitioned into two stages the primary will be a mechanical unit which is liable for releasing water into the Ganga and the second at sewage treatment plants (STP). Taking a gander at this one of a kind reports it is captivating to the point that we can utilize the recuperating powers that Ganga has itself to mend our regarded stream, Ganga.

Accordingly, taking a gander at the organic remediations to clean Ganga - Ganga Purification - there are some encouraging microorganisms and bacteriophages that can be used to regard dangerous synthetic substances just as harmful microbes separately.

We as humans must respect and take care of our natural ecosystems and most importantly clean up the mess that we have been creating since we speciated into *Homo sapiens* as this beautiful earth and its resources are just not created for us but for every species that live on it.

Eminently, the physical property of water at the Gomukh is additionally exceptional, as saw during the examining, heaps of silt spouts protesting in the streets alongside water at this source site which is because of the softening permafrost. Regularly, the Himalayan permafrost [4] melts and structures the root of Ganges. We accept the bacteriophages caught at an a lot prior time scale in the Himalayan permafrost as abiotic particles are being discharged step by step with the liquefying permafrost, in this manner making a seed wellspring of bacteriophage at Gomukh. As far as we could possibly know this is the primary earth shattering finding of its sort. An ongoing distribution shows that 30,000 years of age solidified monster infection was found somewhere down in the Siberian Permafrost, was resuscitated and still irresistible [5]. Strikingly, another gathering has detached a mild bacteriophage from Antarctic Dry Valley condition against *Psychrobacter*-an extremophile and considered its genomic perspectives [6].

## Conclusion

The above expressed discoveries actually energize and brief for additional historic prospects with investigating bacteriophages and its restoration in the solidified Himalayan permafrost.

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