International Journal of Applied Research 2017; 3(6): 310-312

ISSN Print: 2394-7500
ISSN Online: 2394-5869
Impact Factor: 5.2
IJAR 2017; 3(6): 310-312
www.allresearchjournal.com
Received: 20-04-2017
Accepted: 21-05-2017

Bhupendra Prasad
Department of Microbiology, Career College Bhopal, Madhya Pradesh, India

Reena Antony
Department of Microbiology, Career College Bhopal, Madhya Pradesh, India

Jitendra Malviya
Department of Microbiology, Career College Bhopal, Madhya Pradesh, India

Arti Kaushal
Department of Microbiology, Career College Bhopal, Madhya Pradesh, India

Shipra Tiwari
Department of Microbiology, AIIMS Bhopal, Madhya Pradesh, India

Correspondence
Bhupendra Prasad
Department of Microbiology, Career College Bhopal, Madhya Pradesh, India

Bacterial screening of river Kshipra water at Ujjain after Kumbh (Religious Fair)

Bhupendra Prasad, Reena Antony, Jitendra Malviya, Arti Kaushal and Shipra Tiwari

Abstract
It is important to maintain sustainability for our society and city. Kshipra river is the major source of drinking water for 27 % resident of Ujjain, Indore, Dewas. This needs to have kshipra water free of hazardous microbes, after fest of kumbh the water quality should be changed. Microbial study of kshipra river water will help to analyse portability strength. Direct plating with extended incubation periods have been shown to recover significant fractions of the dominant microbial groups in water sample. Kshipra is Holy river that originates from the Kakri-Badi (Indore) of M.P and flows across Ujjain city [23 1 8'N, 75 77'E] which is considered to be geographically, historically, geologically, astronomically and astrologically important. Water quality was assessed in terms of biochemical and microbiological parameters. Sampling Ram ghat were selected. Presence of *Staphylococcus, Bacillus, Pseudomonas* and *E. coli* indicated human activity or sewage input in water body. Microbial parameter was studied following standard protocols. It's a need to develop sustainability measures for the Kshipra river, it is important to maintain sustainability for our society and city.

Keywords: *E. Col,* Kumbh

1. Introduction
Shipra River is considered as a Holy River like Ganga by Hindus and the word Shipra is used as a symbol of purity or sanctity. Holy city of Ujjain is situated on the right of the bank of the river where Simhasta (Kumbh Mela) is held in every 12 years. Simhasta is the religious gathering of Hindus where they worship the river goddess Kshipra and take holy dip in the river water to clean their souls. The Puranas, or ancient Hindu texts, also point that the Shipra river originated from the heart of Varaha, Lord Vishnu's incarnation as a boar. (K. Satish Kumar, 2015) [2].

Shipra is also known as Kshipra or Avanthinadi. The river originates at Kakri Bardi hill of Vindhya Range, 20 km South-East of Indore city near a small village Ujjani 22^0 31'North and 760East. It flows north across the Malwa Plateau through Dewas, Indore and Gwalior districts of the state and joins Chambal river near Kalu-Kher village ($23^o53'$ N and $75^o31''$E). The overall course of the Shipra river is 190 Km with a catchment area of 5600 km^2. Main tributaries of Shipra are Khan River near Ujjain and Gambhir River near Mahidpur. (K. Satish Kumar 2015) [2].

Nowadays river has lost its perennial nature and now runs dry for a period of 5 to 6 months per year. Water of Shipra river is used for drinking, industrial and irrigation purpose and the main land use along the river is agriculture. There are three small dams on Shipra River with total irrigation area of 3703 Km^2. (K. Satish Kumar, 2015) [2].

The Kumbh Mela is the Great Religious Bathing Festival of India, celebrated in a cycle of 12 years in the four cities of Prayag (Allahabad), Haridwar, Ujjain and Nashik. The Kumbh Mela in these cities is celebrated as per the specific configuration of the planets. The Kumbh mela in Ujjain is popularly known as Sinhastha due to its special significance since a rare configuration of planets takes place in twelve years with the Sun in the Aries and the Jupiter in the Leo- Sinha Rashi (Arpita Bansal, 2013) [1].

At least 30 million visitors are expected to visit Ujjain during the fair starting April 22 and the government is leaving nothing to chance. Over a span of one month over a 100 million people are estimated to take a dip in Ujjain's Shipra river. Most people pay their respects at the Ram Ghat is Ujjain.

River Shipra as a water resource face a host of serious threats, all of which are caused primarily by human activity. During the study on river shipra water it was found that the Biochemical Oxygen Demand (BOD) levels - which are used as a measure of the level of organic pollution in the water had increased to 7.4mg per litre at the main bathing place, known as Ram Ghat. Consumption of contaminated water with the bacteria can lead to pathogenic diseases like typhoid and bacterial gastroenteritis. Industries on one hand manufactures useful products but at the same time generates waste products in the form of solid, liquid or gas that causes serious problems. **(**Dubey Savita. 2013) [3]. Main contributors to the surface and ground water pollution by the cultural rituals and activities, byproducts of various industries. Water samples were studied before, after and at the time of Kumbh fair. Various bacterial colonies were seen on culture plate and confirmed as *Escherichia*, *Bacillus*, *Pseudomonas* and *Staphylococcus* using selective media and biochemical test. Presence of *Staphylococcus, Bacillus, Pseudomonas* and *E. coli* indicated human activity or sewage input in river water of Shipra river. (Bhupendra Prasad 2015) [4].

Material Method

Materials and methods

Collection of water sample: Water-sample was collected from River Shipra, Ram Ghat at Ujjain, M.P. after Kumbh Mela. All samples were collected in sterile 100 ml tubes and refrigerated until they were processed.

Isolation of bacteria: Initially serial dilution of sample was prepared and 10^{-4} dilution was spread on presterilizing medium to get the luxuriant growth of bacteria. Based on colony morphology different selective medium was used to support the growth of specific bacteria. The selective medium used was Mannitol salt agar, Pseudomonas agar, Eosine methylene blue agar, and Luria agar. Further, plate count was performed using colony counter.

Biochemical analysis: Different biochemical tests were performed of Bergey's Manual such as, IMVIC, Citrate utilization, Motility, Coagulase, Catalase and Oxidase test (Bergey's Manual).

Results & discussion

Samples were isolated from River Shipra, Ram Ghat at Ujjain, M.P. after Kumbh Mela. The colonies formed by these bacteria on selective media were slightly viscous, slimy, glistering, smooth, whitish, weakly convex, fluorescent 2-10 mm in diameter. Four bacterial isolates were observed from water sample collected from VIP road. Characterisation of bacteria was done using selective media at 37 ^{0}C for 48 hours. Manintol salt agar for *Staphylococcus* Species; Pseudomonas agar for *Pseudomonas* Species; EMB agar was taken for *E.coli* Species and Luria agar is for *Bacillus* Species isolated. The colonies were shown in Fig. 1, 2, 3 and 4. Biochemical characterization was done by performing various tests IMVIC, Citrate utilization, Motility, Coagulase,

Catalase and Oxidase test (Table. 1). *E. coli* shows positive result for Indole, MR, Mobility and Catalase test. *Bacillus* species gave positive result for VP, Citrate, Motility and Catalase test. *Pseudomonas* was positive for Citrate, Motility, Catalase, Coagulase and Oxidase test. *Staphylococcus* showed positive result for MR and Catalase test. All four isolates were catalase positive. The presence of catalase enzyme was shown using hydrogen peroxide.

Bacterial Culture

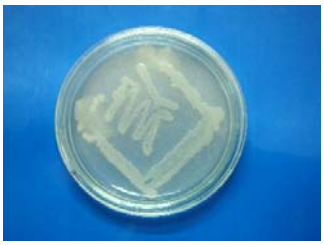

Fig 1: *Bacillus* Species

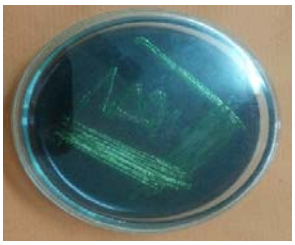

Fig 2: *E. Coli* Species

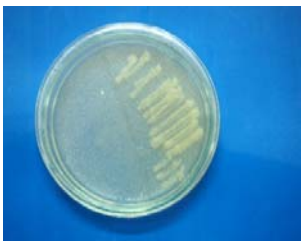

Fig 3: *Pseudomonas* Species

Fig 4: *Staphylococcus* Species

Table 1: Biochemical Test

S. No	Test	*E. coli*	*Bacillus*	*Pseudomonas*	*Staphylococcus*
1	Indole	+	-	-	-
2	MR	+	-	-	+
3	VP	-	+	-	-
4	Citrate	-	+	+	-
5	Motility	+	+	+	-
6	Catalase	+	+	+	+
7	Coagulase	-	-	+	-
8	Oxidase	-	-	+	-

The growth of all bacteria isolates was calculated by colony count method at 10^{-4} dilution. The growth of cell was directly influenced by temperature. All strains such as *E. coli, Bacillus, Pseudomonas* and *Staphylococcus* species showed less growth in summer season in contrast to rainy season (Fig.5). The profound growth in rainy season is due to availability of more nutrient in the lake as sediment water also mixes with upper layer thus making nutrient more available. The observation made using simple technology reflect the presence of pathogenic species such as *Bacillus* and *Staphylococcus* species in lake water. Presence of such bacteria may be avoided to reduce chance of health hazard

in population. Further study followed in the current research combine the application of mechanical (Beads and Sonicator) and soft lysis (SDS and enzyme) method for the isolation of total DNA from sediment of Shipra river followed by its quantification and purity assessment. (Bhupendra Prasad 2016) [5].

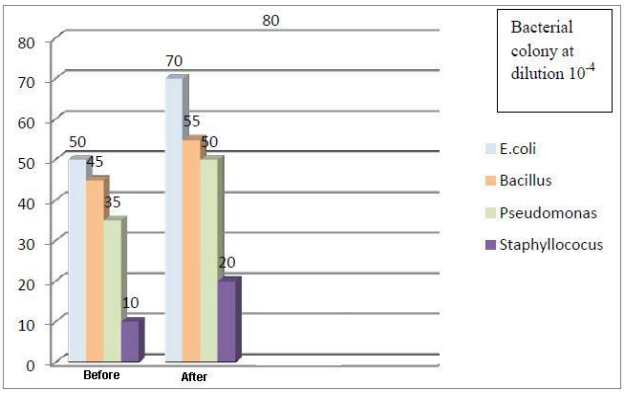

Fig 5: Growth of bacteria at 10^{-4} dilution (colony count method)

Reference

1. Arpita Bansal. Mega Events as Catalyst for Urban Transformation- A Case of Kumbh Mela in Ujjain. Academia.edu – Share research. 2013.
2. Satish Kumar K, Tiwari HL, Galkate RV. Water availability assessment in shipra river. International Journal of Research in Engineering and Technology. 2015; 4(11).
3. Dubey Savita. Analysis of Physico-Chemical Parameters of *Kshipra river* Water at Ujjain. International Research Journal of Environment Sciences. 2013; 2(7):1-4. ISSN 2319–1414.
4. Bhupendra Prasad, Reena Antony, Anima Bidua. Microbial diversity analysis of Upper Lake of Bhopal, Madhya Pradesh. Journal of Environmental Science, Computer Science and Engineering & Technology. 2015; 4(3):000-000, E-ISSN: 2278–179X.
5. Bhupendra Prasad, Tilottama Choudhury, Reena Antony. Bacterial Diversity Analysis of Upper Lake, Bhopal (M.P) India, Using Metagenomics. International Journal of Applied Sciences. 2016; 03(01), ISSN 2455-4499.