

# Impact of Human Activities on Physico - Chemical Condition of Yamuna River Water at Mathura

Ashok Kumar, \*Dr. Praveen Sharma, Dr. D.D. Dwivedi,  
DEPT. OF ZOOLOGY, BSA (PG) COLLEGE , MATHURA (UP) INDIA.  
\*Corresponding Author.

DOI: 10.29322/IJSRP.8.9.2018.p8117  
<http://dx.doi.org/10.29322/IJSRP.8.9.2018.p8117>

**Abstract:** An attempt has been made to study on physico - chemical condition of Yamuna river water. Three sampling sites were selected for the study. The duration of study was July 2016 to June 2017. The parameters studied were temperature, turbidity, pH, hardness, TDS, DO, BOD, and COD were found above the tolerance limit. Thus the water of river Yamuna was unfit for human consumption.

**Key words-** Turbidity, pollution, pollutants, DO, BOD

## Introduction

The riverine system of India has been the centre of human activities, and since the time immemorial, human dwellings gathered in the form of villages and cities near or around this system. Mathura, the sacred birth place of lord Krishna is situated on the right bank of holy river Yamuna flowing from Delhi to Agra direction.

Due to rapid civilization & industrialization, many pollutants (in the form of domestic, industrial, agricultural effluents, cremation residues etc.) disposed of directly or indirectly in the river Yamuna. Mathura being religious town, millions of pilgrims from the every corner of the world visit this place every year. According to a ritual, a bath in the river Yamuna gives the desired fruits of the devoties. Therefore, everyday there is a large gathering of people at the bank of the river Yamuna. Yamuna water receives pollutants in the form of detergents, flowers, raw milk, sweets and other pooja materials.

## Material and Methods

From the chosen three sites, the sampling was done on second week of every month in glass bottles of capacity 300 ml. Some physico-chemical parameters were determined on the spot with the help of portable water detection kit (model No. CK 710, manufactured by Century Instruments Pvt. Ltd. Chandigarh). Other parameters were determined in laboratory from samples using the methods suggested by APHA- 1985, and NEERI manual 1986. The results were compared with standard permitting parameters as suggested by WHO and ISI.

## Results and Discussion

Temperature is an important physical parameter. Temperature was found accordance with the seasonal changes. It ranged between 17.7°C to 34.7 °C It was higher in summer months and lower in winter months. Turbidity is caused by untreated and undecomposed organic matters, It is a common indicator of pollution, sewage and industrial waste. It was maximum (121 NTU) in July 2016 and minimum (67 NTU) in January 2017.

**Table:** Physico-chemical characteristics of river Yamuna  
(Values are the average of Three different sampling sites in 2016-2017)

Parameter	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
Temperature (°C)	29.9	29.3	22.4	23.4	21.8	18.9	17.7	22.3	23.4	27.8	31.1	34.7
Turbidity (NTU)	121	117	107	87	77	104	67	72	91	73	87	111
pH	7.4	7.3	7.7	8.3	8.3	7.8	8.5	7.9	7.8	7.5	8.2	8.5
Hardness (mg/l)	467	482	390	3.4	340	432	432	294	408	378	341	417
TDS (mg/l)	497	411	401	526	588	477	477	503	651	605	616	675
TSS (mg/l)	419	407	478	381	437	501	501	422	478	432	477	505
DO (mg/l)	2.1	2.2	4.1	6.5	4.3	8.2	8.2	3.9	9.8	5.4	2.1	1.9
BOD (mg/l)	33.3	32.4	6.7	9.8	18.1	6.5	6.5	30.3	11.2	22.7	39.4	41.2
COD (mg/l)	44.2	30.4	14.5	22.2	33.1	19.4	19.4	33.8	21.0	54.4	46.8	55.4

The acidic or alkaline nature of water indicates by pH, the Yamuna water was found slightly alkaline. It ranged between 7.3 to 8.5. The findings are accordance with *Kumar and Sharma 2004, 2005*. Hardness of water is due to the presence of Ca and Mg salts. Hard water does not form lather with soap and have high boiling points. Hardness ranged between 294 to 482 mg/l.

Total dissolved solids indicate the severness of pollution. TDS show highly fluctuations. It ranged between 401 to 675 mg/l. (*Sexena et.al.1971*). total suspended solids were found higher in summer while lower in winter. TSS ranged between 381 to 505 mg/l. The observations were similar to *Mathur et.al. 1987, Sexena et. al. (1991)* and *Shangi et. al. 1993*.

Oxygen is essential for the decomposition of chemicals waste and dead matter. It ranged between 1.9 to 9.8 mg/l. It show highly fluctuating values (*Kumar and Sharma, 2005*). BOD is the amount of oxygen required by living organisms for the decomposition organic waste material. It was found very high in summer and lower in winter (6.1 to 41.2 mg/l). COD is the amount of oxygen required for decomposition of chemical wastes. A high value of COD shows a high accumulation of organic water in water body. It ranged between 12.1 to 55.4 mg/l. (*Shankar et al. 1986, Reddy et al, 1985, and Sanger et al 1983*).

## Summary and Conclusion

Above study indicates that water quality of river Yamuna at Mathura is severely polluted and the use of its polluted water may cause severe health problems. Remedial measures are required to sustain the good quality of water and also to save the life of people.

## References

- APHA (1992). "AWWA. WFCW in standard method or the examination of water and waste water. American public health Association, New York.
- Dakshini K.M.M. and Soni J.K. (1979). 'Water quality of sewage drains entering Yamuna at Delhi'. *Ind. J. Env. Hlth.*, 21(4): 354-360.
- Kumar Praveen and Sharma H.B. (2004). Studies on fluctuating trends in some aquatic micro-organisms of RadhaKund at Mathura, *Flora and Fauna*, 10(1): 22-24.
- Kumar Praveen and Sharma H.B. 2005 'Physico-chemical characteristics of lentic water of Radhakund (District Mathura)'. *Ind. J. of Env. Sc.* 9(1): 21-22.

- Mathur A.Y.C. Sharma, D.C. Rupainwar, R.C. Murthy and S.V. Chandra 1987. 'A study of river Ganga at Varanasi with special emphasis on heavy metal pollution. Pll. Res. 6(1): 37-44.
- Reddy M. and P.V. Venkateshwaralu (1985). 'Ecological studies in the paper mill effluents and their impact on river Tungabhadra : Heavy metals and algal. Proc. Ind. Acad. Sc. (Plant Sci), (3): 139-146.
- Sangu R.P.S., P.D. Pathak and K.D. Sharma (1983). 'Monitoring of Yamuna river at Agra. Proc. Of the Nat. Confr. On river Poll. And huan health.
- Saxena K.K. and R.R.S. Chauhan (1993). 'Physico-chemical aspects of pollution inriver Yamunaat Agra, Ploo. Res., 12(2): 101-104.
- Shaji C. and R.J. Patel (1991). 'Chemical and biological evalution of pollution in the river Sabarmati at Ahemadabad, Gujrat Phycos. 30: 981-1000.
- Shankar V., R.P.S. Sangu and G.C. Joshi (1986). 'Impact of distillery effluents on the water quality an eco-system of river Reh in Doon valley, Poll. Res. 5(3&4): 137-142.
- Siddiqi Z.M., R.S. Panesar and S. Rani (1994). 'Bio-chemical effect on few sewerage disposal on the water quality of Sutle river. I.J.E.P., 14(10): 740-743.
- WHO (1984). 'International Standard for water. Third ed. Geneva.

\*\*\*\*