



METEOROLOGICAL STUDY OF RIVER PANDU AT KANPUR

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ABSTRACT

The continuous discharge of domestic and industrial effluents in the river may involve the addition of excessive amounts of toxic and organic matter. The latter on decomposition cause depletion of dissolved oxygen and cause ecological imbalance in water, affecting the growth of aquatic flora and fauna. Such organically polluted rivers, below the outfall, have been classified under three different zone.

Key words : Meteorological, River Pandu, Kanpur

INTRODUCTION

Recently increased industrial activity throughout the world, followed by introduction of waste material (liquids and solids) has caused marked ecological changes in the streams. The resulting typical and characteristics changes in the chemical and physical conditions of the streams and associated aquatic biota has led to the reduction of dissolved oxygen level, production and development of the toxic zones in the streams. Major problems arises from the increase in the concentration level of the substances like, trace elements, surface active agents alkyl benzyl sulphonates etc. organic pesticides, hydrocarbons, their derivatives and cyanides, etc., which are very less biologically oxidized in the streams. Such substances (pollutants) may be metabolic inhibitors (poisons) and act to alter the physico-chemical characteristics and thereby, eliminating the biological assemblages in stream. Attention has also been paid towards the temperature changes as a result of hot water discharge¹⁻⁴. Abnormal increase in concentration level of nutrients and other oxygen consuming species has also been the subject of much discussion as these reduce D. O. level and also cause utrofication.

Foreign river systems have been more extensively studied than Indian river

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systems practically very little information is available regarding the rivers in Uttar Pradesh. Physico-chemical characteristics of river Ganga, used as a measure of water pollution level at Kanpur were studied by Sexena et al.⁵. A short term physico-chemical study of river Ganga at Kanpur has been made by Pandey and Pandey⁶.

The water quality of river Pandu at Kanpur was studied by Srivastava⁷ in April 1972. Arora and Das⁸ have made an effort to study the dispersion characteristics and concentration level of the dissolved nitrogen species discharged from the fertilizer plant (I. E. L., Kanpur) into the river.

Seasonal variation in temperature was observed at 34°C in summer and 15°C in winter. Records on hydrobiological studies of riverine system are less. Some available important records on foreign lotic waters are Allen⁹, Rainhard¹⁰, Whitton and Dalpra¹¹ and Hynes¹². Pollutational characteristics of the waste water discharge from the fertilizer factory into the river Pandu have been studied by Jain¹³. Similar studies on water quality of Yamuna, Ganga and Kalinadi has been performed by Bhargava¹⁴.

EXPERIMENTAL

Materials and methods

- (i) Temperature was measured by mercury thermometer
- (ii) pH and electrical conductance were measured by pH meter and conductivity meter
- (iii) DO was measured by Winkler method (iodometry)
- (iv) Transparency was observed by Sacchi disc of 20 cm
- (v) Total hardness was determined by E. D. T. A. titration.

RESULTS AND DISCUSSION

In any ecosystem, abiotic and biotic factors are inseparably inter-related and interact upon each other. Hydrobiological study without meteorological study of the area is meaningless.

The range of variations in temperature was observed from 13.0 to 32.0°C. Except for the months of February, March, April, May, October and November, every month had showers. Total rainfall recorded during the year was 665.0 mm. The maximum relative humidity was recorded on 29th July while the shortest photoperiod was on 29th December and largest on 20th June (Figs. 1, 2, 3, 4).

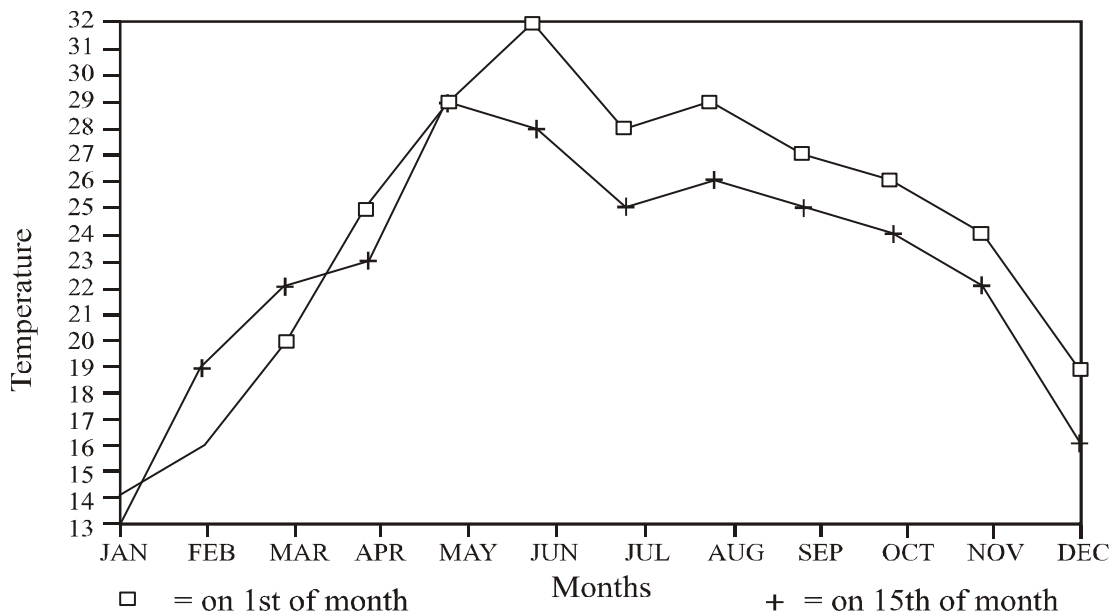


Fig. 1 : Temperature

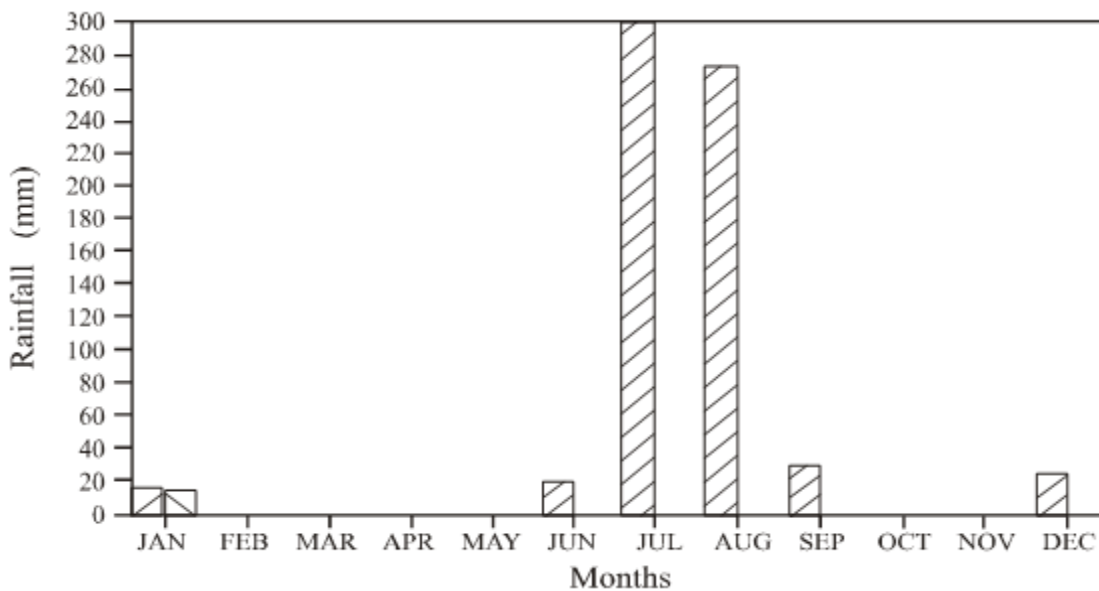


Fig. 2 : Rainfall

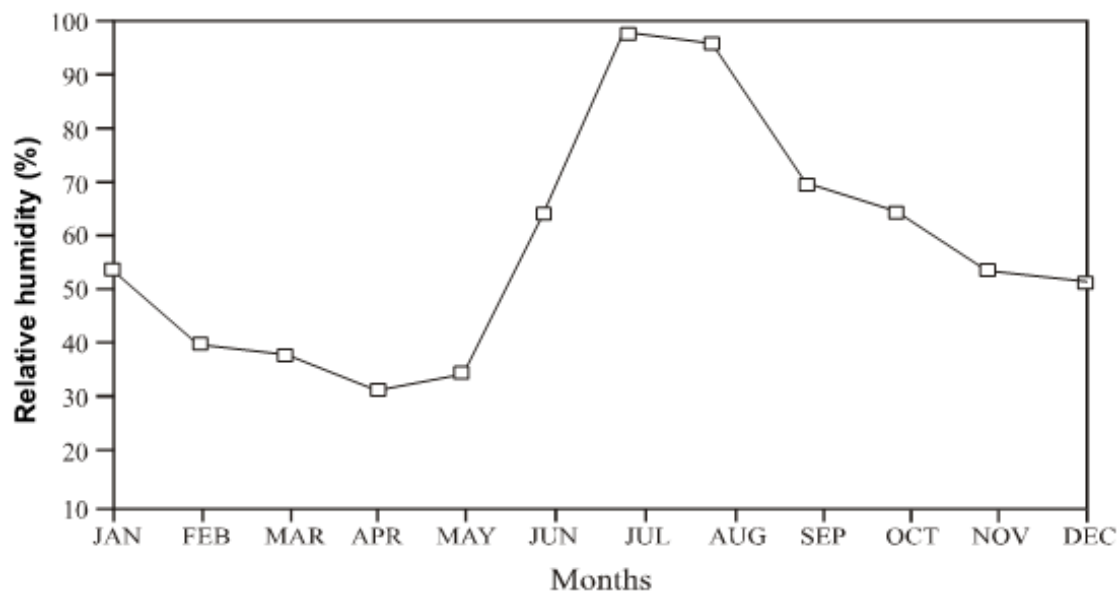


Fig. 3 : Relative humidity

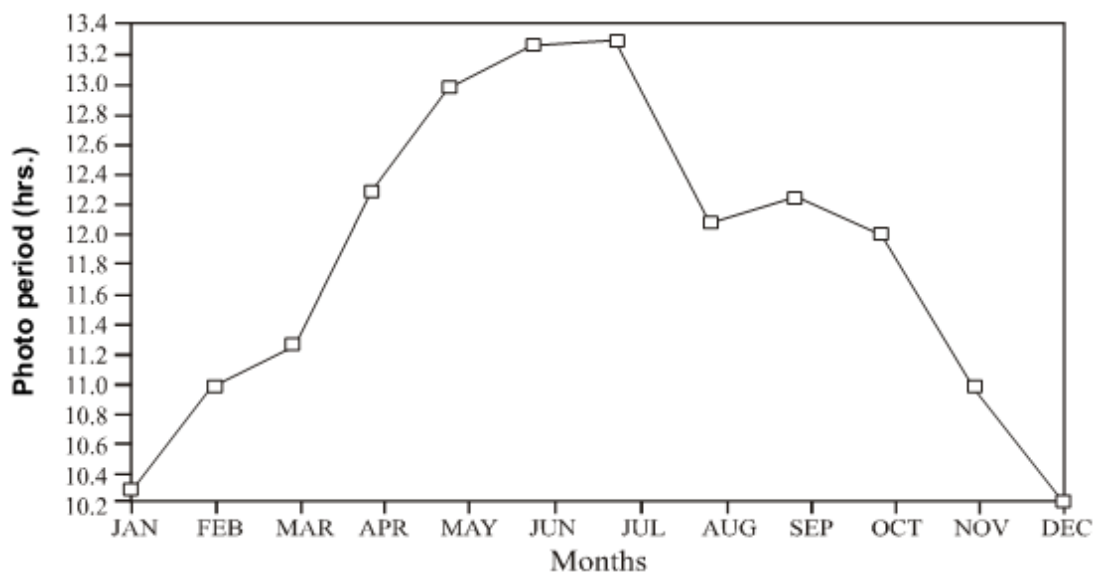


Fig. 4 : Photo period

Table 1. Meteorological study of river Pandu at Kanpur

Months	Atm. temp.		Rainfall (mm)	Relative humidity (%)	Photo-period (hrs.)
	1st	15th			
Jan.	14	13	15.0	54	10.86
Feb.	16	19	-	40	11.00
Mar.	20	20	-	38	11.28
Apr.	25	23	-	32	12.30
May	29	29	-	35	13.00
June	32	28	20	64	13.28
July	28	25	300	98	13.30
Aug.	29	26	275	96	12.08
Sept.	27	25	300	70	12.26
Oct.	26	24	-	65	12.00
Nov.	24	22	-	54	10.98
Dec.	19	16	25.0	52	10.20

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