Atmospheric Evaluation of Jaunpur

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Abstract

We have presented atmoshpheric evaluation of jaunpur for temperature and relative humidity.

Introduction

Climate of Jaunpur is characterized by a very hot and dry summer and bracing cold winter due to prevalence of dry continental air almost throughout the year. Monsoon approached Jaunpur from Southern and two tropical maritime air reaches in this area with high humid clouds and rains. A brief description data related to the temperature, relative humidity, barometric pressure, rainfall, wind speed and wind direction is mentioned under the micrometeorology data.

Jaunpur experiences tropical weather and have three distinct seasons in a year.

1. Hot dry summer season from March to June.
2. Hot wet or monsoon season from July to September/October.
3. Cold dry winter season from November to February.

Micrometeorology data:

Micrometeorology data of Jaunpur was collected from India Meteorology Department (IMD). A permanent station, which collects the data daily at 08.30 and 17.30 hours. For the present study daily data was collected from March 2003 to February 2004 for complete cycle of 12 months to cover all the seasons of the year. Meteorological data of each season are discussed below.

Temperature:

Temperature is one of the most important factors, which directly affects the concentration of pollutants in the environment. The asphalt, concrete and steel in urban areas get heated quickly due to solar radiations and have high storing capability of heat as compared to rural areas. The urban areas also give off heat through the combustion and industrial processes which may be 10% or more of the solar radiation. Change in climatic conditions is obviously due to human activity. Data is required to correct the volume of collected air during collection of air samples. The temperature in Jaunpur varies from 40°C to 45.8°C of the year 2004-2005. The temperature starts rising sharply from March till June. It is observed that the month of May was the hottest month of the year. The highest temperature were recorded in this month was 45.50C with an average 41.4°C. With the advancement of monsoon around end of the June there was some drop in the day temperature while the night still continues to be quite warm. After withdrawal of monsoon by October there was marginal increase in day temperature, however, night becomes progressively cooler. The decrease in the temperature was rapid from end of December. January was the coldest month of the year, daily minimum & maximum and average temperature of 3.2°C and 11.8 °c temperature 7.1°C respectively was recorded. During winter season, cold waves effect the district in the wake of passing westem disturbance. The average temperatures of the year were 18.2 and 32.0oC at 08.30 & 17.30 hrs, respectively. The monthly mean for the period (2004-2005) are presented in the fig no 5. The seasonal variations are given below:

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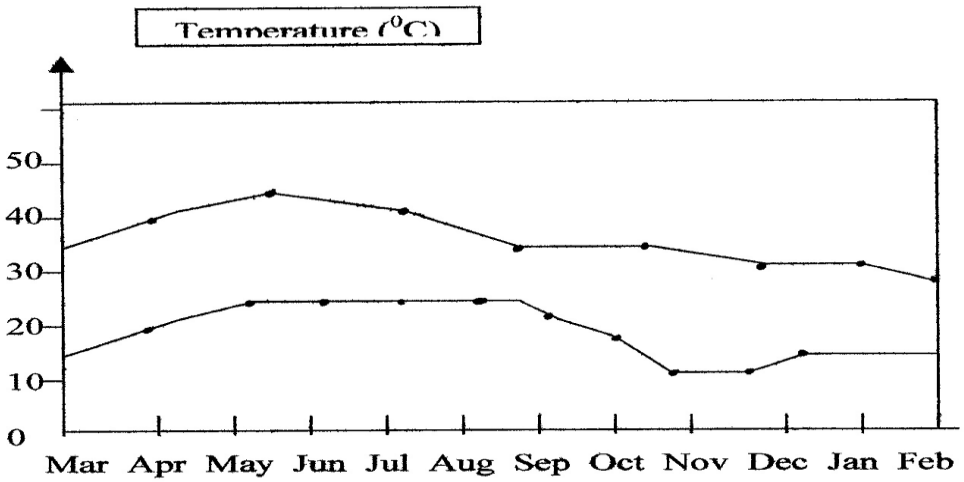


Fig. Monthly mean of temperature in jaunpur city during 2004-2005

Summer:

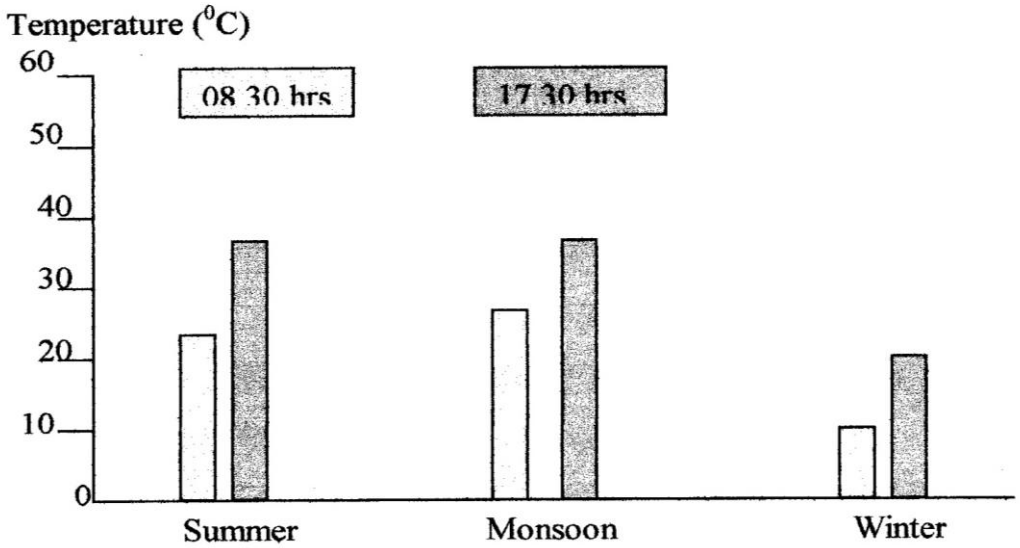
The daily temperature variation of minimum and maximum were 10.s°C and 30.4°C at 08.30 hrs in the month of March and June while 26.7oC and 45.8°e at 17.30 hrs in the month of March and May respectively. The average temperature of season was 20.7°e and 39.0° Cat 08.30 and 17.30 hrs respectively. Seasonal variation is shown in the fig. The monthly variation and average temperature of season is shown in Table 16.

Table 16: Temperature (°C) variation during summer

Month	8.30 hrs			17.30 hrs		
	Min	Max	Average	Min	Max	Average
March	10.5	20.6	16.2	27.7	38.4	32.6
April	14.4	24.8	19.3	33.0	42.1	38.1
May	21.0	28.2	24.6	36.4	45.8	41.4
June	21.4	30.4	26.3	30.0	42.6	37.8
N = 4			21.7			37.5

Monsoon:

The daily temperature variation of minimum and maximum were 15.0 °c and 32.0oC at 08.30 hrs while 21.5 °c and 38°C at 17.30 hrs in the month of October and July respectively. The average temperature of season were 23.1 °C and 30.6°C at 08.30 hrs and 17.30 hrs respectively. Seasonal variation is shown is the below. The monthly variation and average temperature of season is shown in Table 17.



Seasonal variation of temperature in Jaunpur city during 2004-2005

Temperature (°C) variation during monsoon.

Month	**08.30 hrs**			**17.30 hrs**		
	Min	Max	Average	Min	Max	Average
July	23.8	33.6	26.1	29.0	38.0	34.1
August	23.8	30.0	25.3	24.2	35.0	32.1
September	22.0	30.0	25.1	27.0	35.8	33.2
October	14.5	24.5	19.8	20.5	34.8	30.9
N=4			24.1	32.6		

Winter:

The daily temperature variation of minimum and maximum were 3.2 °c and 15.1°e at 08.30 in the month of December and November while 17.8 °e and 32.6°e at 17.30 hrs in the month of January and November respectively. The average temperature of season were 8.90e and 26.1oe at 08.30 and 17.30 hrs respectively. Seasonal variation is shown in the below. The monthly variation and average temperature of season is shown in the Table 18.

Temperature (°C) variation during winter

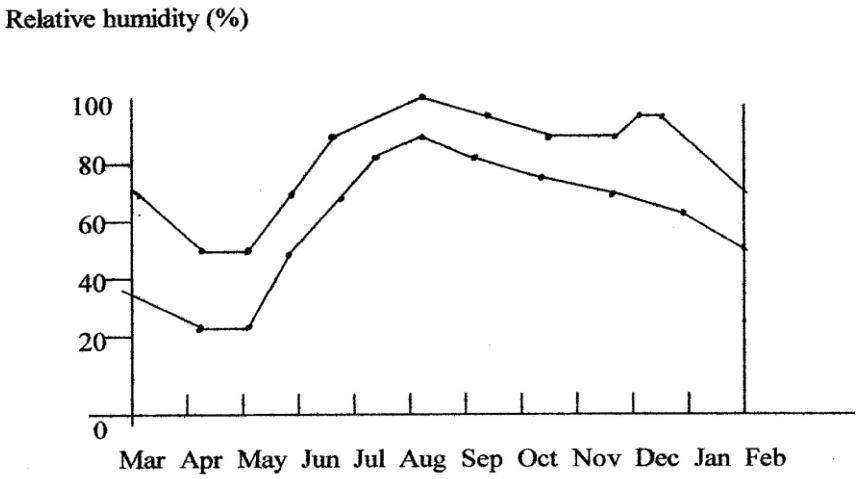
Month	08.30 hrs			17.30 hrs		
	Min	Max	Average	Min	Max	Average
November	8.0	15.1	11.8	24.5	32.6	29.3
December	03.2	11.6	07.1	21.2	26.9	24.8
January	4.5	10.8	7.1	17.8	24.9	24.4
February	06.0	13.2	09.6	20.8	30.0	25.7
N=4			08.9	26.1		

Relative Humidity:

Relative Humidity plays key role in the formation of fog and smog. Visibility noticeably reduces when the humidity exceeds to 67%. Humidity can produce adverse effect on

the material, vegetation and human health (Buma, 1960). Humidity increases anthropogenic ally or by natural ways. Relative humidity is generally found to be lower due to slight higher temperature of urban areas.

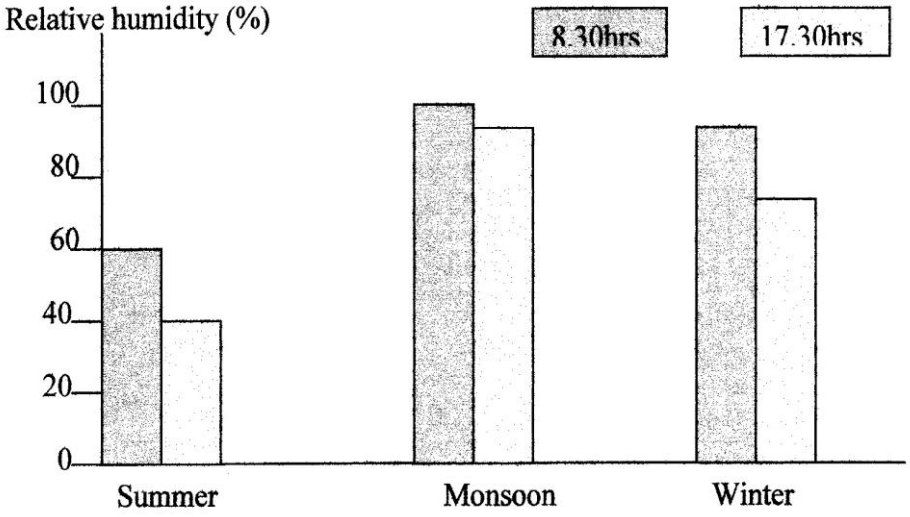
Relative humidity over the area of the year varies from 10% to 99% in the month of January during early morning respectively. It was high during the southwest monsoon in the month of July to September and northwest monsoon in the month of January and varied between 63% and 99% at 08.30 hrs and 36 to 95% at 17.30 hrs with the corresponding mean of 84.2 and 54.5%. The average relative humidity of the year was 72% and 54.1% respectively. Fig no 7:



Monthly mean of relative humidity in Jaunpur city during 2004-2005

Summer:

Relative humidity (RH) varied from minimum to maximum was 21 % and 95% at 8.30 hrs while 10% and 91 % at 17.30 hrs in the month of May and June respectively. The average relative humidity of the season were 51.9% and 32.9% at 8.30 hrs and 17.30 hrs respectively. Seasonal variation is shown in the fig 8. The monthly variation and average of relative humidity of the season is shown in Table 19.



Seasonal variation of relative humidity in Jaunpur city during 2004-05

Table: Relative humidity variation (%) during summer

Month	8.30 hrs			17.30 hrs		
	Min	Max	Average	Min	Max	Average
March	42	80	64.55	12	72	35.90
April	27	54	39.57	11	50	24.13
May	21	61	37.94	10	38	20.77
June	51	95	66.43	33	91	50.80
N=4			52.12			32.90

Monsoon:

Relative humidity (RH) varied from minimum to maximum were 61 % and 98% at 8.30 hrs in the month of October and August while 49% and 98% at 17.30 hrs in the month of July and August respectively. The average relative humidity of the season were 86.1 % and 77.4% at 8.30 hrs and 17.30 hrs respectively. Seasonal variation is shown in the fig. The monthly variation and average of relative humidity of the season is shown is Table 20.

Table: Relative humidity variation (%) during monsoon

Month	8.30 hrs			17.30 hrs		
	Min	Max	Average	Min	Max	Average
July	64	98	84.10	49	94	75.94
August	80	98	89.58	73	98	83.81
September	79	98	86.87	60	97	77.47
October	61	90	83.74	53	98	72.16
N=4			86.07			77.35

Winter:

Relative humidity (RH) varied from minimum to maximum were 52% and 98% at 8.30 hrs while 26% and 95% at 17.30 hrs in the month of February and January respectively. The average relative humidity of the season were 77.7% and 55.8% at 8.30 hrs and 17.30 hrs respectively. Seasonal variation is shown in the fig. The monthly variation and average of relative humidity of the season is shown in Table 6:21.

Table: Relative humidity variation (%) during winter

Month	8.30 hrs			17.30 hrs		
	Min	Max	Average	Min	Max	Average
November	56	98	75.36	40	74	57.90
December	56	95	79.74	40	73	55.97

January	63	99	84.22	36	95	54.55
February	51	99	71.61	26	68	54.55
N=4			77.73			55.75

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