551·515·4 (547·7)

A STATISTICAL STUDY OF THUNDERSTORMS OVER POONA

Statistics have been collected of the number of days of thunderstorms at Poona in each month during the decade 1954–63, from Monthly Meteorological Registers of Poona.

Table 1 gives the monthwise frequency of thunderstorm days, for each of the year 1954-63. Cases where thunder has been heard have also been included in the category of thunderstorms. For practically six months of the year, Poona is free from thunderstorms. No thunderstorm has occurred in February and they are rare in the months November, December, January, July and August. Thunderstorms are more frequent in the months March to June and September-October with a peak in May and September.

Table 2 gives the monthwise frequency of thunderstorms associated with precipitation for each of the years 1954-63. In about 60–80 per cent of the occasions, precipitation has been associated with thunderstorms in all the months of thunderstorm activity. However, March is an exception with number of rainy days being only half the total number of occasions of thunderstorms.

An attempt was made to associate the thunderstorm activity with the occurrence of hail. No definite conclusions could be drawn as the number of occasions of hail have been few compared to the total number occasions of thunderstorms. Four out of five cases of hail have occurred in April.

Table 3 shows the three-hourly distribution of occurrence of thunderstorms in each month. The day has been divided into eight periods of three hours each. A thunderstorm lasting for more than 3 hours is taken as having occurred at both the 3-hourly intervals. It may be seen that period of maximum activity is between 15–21 IST. Nearly 70 per cent of the total occurrence has taken place during this period. Only very few thunderstorms occur during the period 3–12 hours. The rest gets distributed between the intervals 12–15, 21–24 and 0–3 hours.

Table 4 attempts to give an idea of the duration of thunderstorm activity for each of the month of the year.

In most of the cases duration of thunderstorms lie in the range less than 3 hours and thunderstorms with duration greater than 3 hours, *i.e.*, 3–6 and 6–12 hours, are more common during September, October and November.

Table 5 gives a summary of the wind speeds of the squalls associated with thunderstorms. The individual storms were sorted out according to the various force of Beaufort Scale. From the percentage of total storms associated with a given range of velocity, it can be seen that the most common velocity of a squall of a thunderstorm over Poona is Beaufort Scale No. 8, *i.e.*, 42 miles

TABLE 1

Distribution of number of days of thunderstorms

	1954	55	56	57	58	59	60	61	62	1963	Total
Jan	—	—	—	—	1	—	—	—	—	—	1
Feb	—	—	—	—	—	—	—	—	—	—	0
Mar	8	11	—	—	1	—	1	—	4	6	31
Apr	6	3	8	12	11	4	4	8	—	6	62
May	4	9	9	6	6	15	21	13	23	10	116
Jun	4	1	—	5	5	10	2	3	—	6	36
Jul	—	—	—	—	—	1	3	—	—	—	4
Aug	—	—	—	—	4	—	—	—	—	—	4
Sep	—	18	3	2	—	5	16	—	—	4	48
Oct	3	5	15	2	3	1	—	3	4	6	42
Nov	—	—	3	—	6	2	—	1	1	—	13
Dec	—	—	—	—	—	—	1	—	2	—	3
Total	25	47	38	27	37	38	48	28	34	38	360

TABLE 2

Distribution of number of days of thunderstorms with precipitation

	1954	55	56	57	58	59	60	61	62	1963	Total
Jan	—	—	—	—	1	—	—	—	—	—	1
Feb	—	—	—	—	—	—	—	—	—	—	0
Mar	4	5	—	—	1	—	—	—	2	3	15
Apr	5	5	7	7	7	3	3	5	—	2	44
May	2	2	7	4	4	10	19	8	10	5	71
Jun	3	1	—	4	4	8	2	3	—	4	29
Jul	—	—	—	—	—	1	2	—	—	—	3
Aug	—	—	—	—	3	—	—	—	—	—	3
Sep	—	15	1	1	—	5	16	—	—	2	40
Oct	3	3	8	1	3	1	—	2	3	4	28
Nov	—	—	1	—	3	2	—	—	1	—	7
Dec	—	—	—	—	—	—	—	—	—	—	0
Total	17	31	24	17	26	30	42	18	16	20	241

TABLE 3
Diurnal distribution of thunderstorm activity

	Time (IST) of occurrence of thunderstorm activity								
	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24	Total
Jan	—	—	—	—	—	1	—	—	1
Feb	—	—	—	—	—	—	—	—	0
Mar	2	—	—	—	2	18	14	7	43
Apr	4	2	1	—	7	39	16	7	76
May	7	3	2	1	10	68	45	19	155
Jun	2	—	—	—	9	19	11	5	46
Jul	1	—	—	—	—	3	—	—	4
Aug	—	—	—	—	2	2	—	—	4
Sep	4	4	2	—	10	21	16	8	65
Oct	5	4	1	—	6	20	14	8	58
Nov	3	2	—	—	—	7	5	3	20
Dec	—	—	—	—	—	2	1	1	4
Total	28	15	6	1	46	200	122	58	476

TABLE 4
Frequency of time of commencement of thunderstorm activity and duration

	Duration (hrs)	0–3	3–6	6–9	9–12	12–15	15–18	18–21	21–24 IST
Jan	3	—	—	—	—	—	1	—	—
Feb		—	—	—	—	—	—	—	—
Mar	3	2	—	—	—	4	15	12	6
	3–6	—	—	—	—	—	2	1	—
Apr	3	3	1	1	—	6	40	14	5
	3–6	1	1	—	—	2	1	2	1
	6–12	—	—	—	—	—	—	1	—
May	3	7	1	1	1	9	62	40	17
	3–6	—	2	1	—	2	6	3	3
Jun	3	1	—	—	—	8	16	9	5
	3–6	—	—	—	—	1	2	1	—
Jul	3	1	—	—	—	—	4	—	—
Aug	3	—	—	—	—	2	2	—	—
Sep	3	5	4	2	—	10	19	11	6
	3–6	—	—	—	—	—	3	3	2
	6–12	—	—	—	—	—	1	—	—
Oct	3	1	3	1	—	5	17	11	6
	3–6	3	1	—	—	1	2	—	—
	6–12	—	—	—	—	—	—	1	1
Nov	3	—	2	—	—	—	5	2	2
	3–6	2	—	—	—	—	—	—	—
	6–12	—	—	—	—	—	1	1	1
Dec	3	—	—	—	—	1	1	1	1

TABL

	Beaufort Scale: 6	7
	Miles: 28	35
1954	1	4
1955	2	3
1956	—	3
1957	—	—
1958	1	2
1959	—	1
1960	2	2
1961	1	1
1962	—	3
1963	—	1
Total	7	20
Percentage of total storms	8·3	23·5

per hour. Velocities exceeding Beaufort Scale No. 9 (*i.e.*, 50 miles or more per hour) are comparatively rare. It can be generalised that only one-fourth of the total number of thunderstorms over Poona are accompanied by squalls at Poona and in two thirds of such squalls a mean wind speed of 40 miles per hour is reached.

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