Surcula tuberculata Gray.
Drillia ferenuda Cossm.
Drillia bonneti Cossm.
Drillia (*Brachytoma*) *karikalensis* Cossm.
Drillia (*Crassispira*) *sacra* Reeve.
Drillia (*Crassispira*) *sinensis Hinds.*
Drillia (*Crassispira*) *quadricarinata* Cossm.
Drillia (*Crassispira*) *adelomorpha* Cossm.
Mangilia (*Clathurella*) *costicrenata* Cossm.
Mangilia (*Clathurella*) *karikalensis* Cossm.
Swecula (*Turricula*) *lirocostata* Cossm.
Daphnella (*Raphitoma*) *mirocostriata* Cossm.
Mangilia Houdasi Cossm.
Asthenotoma terebralis Cossm.
Raphitoma crenicostata Cossm.
Clathurella bicrenata Cossm.

Family–Actaeonidae : *Actaeon* (*Solidula*) *solidulus* Linn.

Actaeon (*Solidula*) cf. *affinis* A. Adams.

Actaeon (*Solidula*) *bonneti* Cossm.

Family–Ringiculidae : *Ringicula bonneti* Cossm.

Family–Atyidae : *Atys* (*Alicula*) *panaulax* Cossm.

Family–Dentalidae : *Dentalium proteiforma* Cossm.

VII. Climate

Pondicherry Region:

Situated well within the tropics near 12° N latitude on the east coast of India, Pondicherry experiences a hot and tropical maritime type of climate characterised by small daily range of temperature, humid weather and moderate rainfall. There is no clear demarcation of seasons. However, the summer may be taken to last from March to June followed by the period of the south-west monsoon which lasts upto September. The months of October and November constitute the main north-east monsoon season. There is no real cool weather season, but the period from December to February is relatively cool.

*Rainfall** : The average annual rainfall is of the order of 127 cm. Of this about 50 per cent is recorded during October — November and about 25 per cent during the south-west monsoon season. November is the rainiest month contributing about 30 per cent of the annual rainfall. (*Vide* table on pages 114-115). The range of variation of rainfall from year to year is quite large. The highest rainfall recorded was in 1943 which was as much as 204 per cent of the normal and the lowest was in 1952 when it was only 49 per cent of the normal. During the period 1911—60 the rainfall was between 80 per cent and 120 per cent for 20 years and above 120 per cent for 14 years. The rainfall was below 80 per cent for 16 years, of which there was one spell of four consecutive years (1947-50), and two spells of two consecutive years (1926-27 and 1952-53). Drought conditions, when the annual rainfall is less than 75 per cent of the normal, may be expected to prevail over the region once in four years on an average. The variability of annual rainfall is fairly large and that of seasonal rainfall still larger. The variations in rainfall from year to year are therefore significant.

In a year there are on an average, about 55 rainy days i.e., days with rainfall of 2.5 mm. or more.

*Temperature***: The period from about the end of February to mid-June is a period of continuous increase in temperature, when the mean daily temperature rises from about 25° C to 32° C. May and the early part of June constitute the hottest period of the year, with the mean daily maximum temperature at about 37°C and the mean daily minimum temperature at about 27°C. The summer days are oppressive due to high humidity. On individual days the maximum temperature may even reach 43°C. The sea-breeze, however, which sets in in the afternoons brings welcome relief. Occasional afternoon thunder-storms also give temporary relief. As the south-west monsoon current sweeps over the region, there is a slight and steady reduction in the temperatures. Mean maximum temperatures during the period of south-west monsoon remain more or less steady around 35°C and the mean minimum around 25°C. December and January form the coolest part of the year with the mean daily maximum temperature at about 28°C and the mean daily minimum temperature at about 21°C. On individual days the mean minimum temperature may be as low as 11°C during this period.

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*Records of rainfall of Pondicherry available for 50 years from 1911 to 1960 are considered here.

**As there are no Meteorological observatories anywhere in the Territory, the study of temperature of all the four regions is based on the data of neighbouring areas experiencing similar climatic conditions.

Humidity : The relative humidity is generally high, being above 70 per cent during August to April. It is at its minimum value of 60 to 65 per cent in June and July.

Cloudiness : During June to November, the skies are usually heavily clouded. In each of these months more than 6/8 of the sky is covered by clouds for more than 15 days. Cloudiness usually decreases thereafter and the skies are usually clear or lightly clouded particularly in the mornings during February to April or May.

Surface winds : Winds are moderately strong throughout the year, except during the transition months of February–March before the summer season and during October before the onset of the north-east monsoon. During May to September, winds are mainly south-westerly in the mornings. In the afternoons they generally blow from south-east as sea-breeze giving relief from summer heat. With the development of the seasonal low over the south Bay of Bengal in October, winds take a northerly component; in November the north-easterlies are fully established which remain till January. From February a westerly component begins to predominate in the mornings, while in the afternoon, winds tend to revert to summer conditions i.e., are south-easterly in direction.

Special weather phenomena : During the north-east monsoon season, depressions and storms from the south Bay of Bengal move across or in the neighbourhood of the region, causing heavy rain and thunder-storms and gusty winds. Tidal waves flooding the low lying coastal areas accompany most of the storms. Thunder-storms generally occur from April to November, being comparatively more frequent in September and October (*Vide* table on page 116).

Karaikal Region:

Karaikal, situated on the east coast of India, near latitude 11° N in the deltaic region of the Kaveri, experiences tropical maritime type of climate with small daily range of temperature and moderate rainfall.

*Rainfall** : Karaikal has an annual average rainfall of about 126 cm., 68 per cent of which occurs during October to December. The amount of rainfall during the south-west monsoon period is small, being less than 20 per cent of the annual. November is the rainiest month, accounting for about a third of the annual total. The range of variation of annual ranifall is wide. During the period 1912–1960,

* Records of rainfall available for 48 years from 1912–1960 are considered.

the highest rainfall (recorded in 1930) was about 198 per cent of the normal, and the lowest one (recorded in 1949) was only 38 per cent of the normal (*Vide* table on pages 114-115). The rainfall was between 80 to 120 per cent of the normal during 20 years. The rainfall was below 80 per cent for 17 years and above 120 per cent for 12 years. There was one long spell of six years from 1947–52, one spell of three years from 1915–17 and one spell of two years 1933–34, when rainfall was less than 80 per cent of the normal. Variability of annual rainfall is fairly large, so that significant variations in rain fall from year to year may be expected. Drought conditions with the annual rainfall of less than 75 per cent of the normal may be expected once in three years on an average.

In a year there are on an average about 55 rainy days, i.e. days with rainfall of 2.5.mm. or more.

Temperature, humidity, cloudiness and surface winds : The level of temperatures in Karaikal is about the same as in Pondicherry. December and January are the coolest months with the maximum at about 28°C and the minimum at about 23°C. Minimum temperature as low as 16°C may sometimes be recorded. The diurnal ranges of temperature are generally small throughout the year, being highest (about 10°C) in May and June, and the least (about 5°C) during November to February.

The level of humidity and the pattern of cloudiness and surface winds are the same as in Pondicherry. Although slight variations in the monthwise occurrence of depressions and storms are noticeable, thunder-storms generally occur during April to November, particularly in April, September and October (*Vide* table on 116 page).

Mahe Region:

This region, situated on the west coast of India near latitude 12° N has a humid and tropical climate, with an oppressive hot season from March to May. The rainfall is plentiful during the south-west monsoon season. The monsoon normally sets in by the end of May or early June and withdraws in early November. There is no real cool weather season. December to February however, is a period of relatively dry and cool weather.

*Rainfall** : The average annual rainfall is 353 cm. Most of this, about 80 per cent occurs during June to September and about 10 per cent during October-November. July is the rainiest month which alone accounts for about a third of the annual total rainfall (*Vide* table). The highest rainfall during the period

* Rainfall records of Mahe available for 41 years from 1912 to 1952 have been considered here.

1912–52 was recorded in 1947 which was 228 per cent of the annual normal. The lowest one was recorded in 1944 which was 46 per cent of the annual normal. The rainfall was more than 120 per cent for six years, between 80 per cent to 120 per cent for 25 years, and less than 80 per cent for 10 years. During the period under consideration there was one spell of three consecutive years (1917–1919) and two spells of two consecutive years each (1944–1945 and 1951–52) when the rainfall was less than 80 per cent of the normal. The variations in annual rainfall from year to year are not significant.

In a year there are about 120 rainy days, i.e., days with rainfall of 2.5 mm. or more.

Temperature: Days are coolest during the south-west monsoon months from June to September when the mean maximum temperature is about 29°C and the mean minimum about 24°C. From October, the day temperatures gradually increase till April when the mean maximum temperature reaches about 33°C and the mean minimum is about 26°C. April together with part of May constitutes the hottest period of the year, when on individual days the temperatures may go as high as 37°C. Night temperatures start decreasing gradually from November and reach their lowest during January, the mean minimum temperature being about 22°C. On individual days minimum temperature may fall as low as 16°C. After January, the night temperatures again start rising, till the advent of the monsoon about the end of May or early June when the minimum temperature reaches 26°C on the mean. In the hot season, the days are oppressive but the sea-breeze that sets in in the afternoons brings some relief. Afternoon thunder-storms in April and May always afford good relief.

Owing to maritime influence, diurnal range of temperature is small. It is at its maximum—about 10°C during December to February; during other months it ranges between 5–7°C.

Humidity : Humidity is very high throughout the year. Relative humidity is more than 70 per cent from April to November; during the remaining months also the relative humidity is over 60 per cent.

Cloudiness : During the south-west monsoon season the skies are generally heavily clouded to overcast, while during April and May and in the months of retreating monsoon *viz.* October and November, the skies are moderately clouded. For the rest of the year skies are clear or lightly clouded.

Surface winds : Generally moderate throughout the year, winds blow usually from west to north-west in the monsoon months. In other seasons, however winds blow from north-east to east in the mornings and from west to north-west in the evenings.

Special weather phenomena : Storms and depressions forming in the Arabian Sea during May affect the region and the neighbourhood causing temporary advance or early onset of the south-west monsoon. Some of the storms originating in the Bay of Bengal travel across the Peninsula in a weakened form and emerge out into the Arabian Sea and get revived there affecting this region. These storms and depressions occurring mainly during June to November cause the maintenance of the monsoon current over the region. In association with these systems, thunder-storms, heavy rain, and squalls are experienced, particularly during April to July and October to November (*Vide* table).

Yanam Region :

Situated within the tropics near 17°N latitude and in the deltaic region of the Gautami Godavari river, Yanam experiences a climate which is characterised by high humidity throughout the year, an oppressive summer season and good rainfall. March to May constitutes the summer season followed by the south-west monsoon season upto September. October and November form the retreating monsoon season. This period is also marked by the advance of the north-east monsoon over the region. December to February is the coolest part of the year.

*Rainfall** : Annual rainfall averages about 136 cm. The onset of the south-west monsoon takes place normally by the first week of June. Its withdrawal in September or October is followed by the advance of the north-east monsoon which withdraws by the end of November. About 55 per cent of the annual rainfall occurs during the south-west monsoon season (June to September) and approximately 35 per cent during the post monsoon months (October and November). October is the rainiest month accounting for over 23 per cent of the annual rainfall. The range of annual rainfall is fairly large. The highest rainfall during the 1912–53 period was recorded in 1916 and this was about 168 per cent of the annual normal; the lowest rainfall was recorded in 1946 when it was as low as about 50 per cent of the annual normal. During the 42 year period under consideration, the annual rainfall was over 120 per cent for 12 years, between 80 per cent and 120 per cent for 19 years, and below 80 per cent for 11 years. There was also one spell of three years (1945–47) and one spell of two years (1942–43) when the rainfall was less than 80 per cent of the normal. Variability of the annual rainfall is fairly large and variations in the annual rainfall from year to year can be significant.

During a year on an average, there are about 60 rainy days i.e. days with rainfall of 2.5 mm. or more.

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*Rainfall records of Yanam available for 42 years from 1912 to 1953 are considered here.

Temperature : From February, temperatures start rising rapidly till May which is the hottest month with the mean maximum around 37°C and the mean minimum around 28°C. Humidity being high, the heat is very trying. The maximum temperature on some days in May or early June before the onset of the south-west monsoon may even touch 47°C. The sea breeze, however, affords some relief in the afternoons. Similarly pre-monsoon thunder-showers may also bring welcome relief on some days. With the onset of the monsoon in June the temperature falls rapidly and remains almost steady till September. In this season mean maximum temperature is around 32°C and the night temperatures fall rapidly till December or January when day temperatures are around 27°C and the night temperatures around 19°C. Sometimes the minimum temperature may reach as low as about 14°C. December and January are the coolest months.

Humidity : The air is generally humid throughout the year with relative humidity—over 70 per cent in the mornings and over 60 per cent in the evenings during all the months.

Cloudiness : The skies are generally heavily clouded to overcast during the south-west monsoon months. There is moderate cloudiness in the post–monsoon months. During the rest of the year, the skies are clear or lightly clouded.

Surface winds : In the summer season winds blow from directions between south-east to south-west. During the monsoon season, they blow mainly from south-west to west. During October to February, winds are usually from north-east in the mornings, veering towards south-east in the afternoons. Winds are generally light to moderate during the whole year.

Special weather phenomena : A few of the storms and depressions which form in the Bay of Bengal in the pre-monsoon month of May, and during September to November, cross the east coast, and affect the region and the neighbourhood, causing thunder-storms, heavy rain and strong winds. Tidal waves may sometimes be generated by storms. Occasional thunder-storms associated mainly with the onset of the south-west monsoon occur in April, May and June (*Vide* table).

TABLE

Normals and extremes of rainfall in millimetres

Region	Jan.	Feb.	March	April	May	June	July
Pondicherry ..	50.4	14.1	24.3	24.2	50.1	37.8	59.1
Karaikal	78.5	17.2	25.0	24.7	39.1	31.1	43.3
Mahe	3.0	10.2	12.3	57.1	201.0	954.5	1121.1
Yanam	12.4	17.3	9.7	17.9	53.1	129.9	228.3

in Pondicherry, Karaikal, Mahe and Yanam.

Aug.	Sept.	Oct.	Nov.	Dec.	Annual	Highest annual rainfall as percentage of normal and year*	Lowest annual rainfall as percentage of normal and year*
108.8	120.4	262.4	369.1	152.1	1272.7	204 (1943)	49 (1952)
62.7	80.0	229.2	398.3	229.4	1258.5	198 (1930)	38 (1949)
565.5	222.0	243.1	111.8	25.7	3527.1	228 (1947)	46 (1944)
183.3	211.2	315.0	171.5	11.6	1361.2	168 (1916)	51 (1946)

* Years given in brackets.

TABLE 2

Monthwise occurrences of storms during the period 1891–1960

Month	*Pondicherry*	*Karaikal*	*Mahe*		*Yanam*
January	1	—	—	—	—
February	1	—	—	—	—
March	1	1	—	—	—
April	1	1	—	—	—
May	2	3	1	3	4
June	—	—	—	—	—
July	—	—	—	—	—
August	—	—	—	—	1
September	—	—	—	—	10
October	4	2	—	—	17
November	14	15	6	1	4
December	3	5	1	—	1
Total ..	27*	27*	8*	4**	37*

* Originating in the Bay of Bengal.

** Originating in the Arabian Sea.

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