8. Study of population density and frequency of different plant populations, by quadrat method.

Date : / /

Aim : To study population density and frequency of plant population by quadrat method.

Principle :

1. All the different types of individual plants growing at a particular space or geographical area at a particular time, forms (constitutes) plant population of that area.
2. It changes from time to time and may increase or decrease due to many different factors.
3. The number of individuals of a species present per unit area at a given time is called population density.
4. The population density (D) can be calculated as D = N/S. where N = Number of individuals of a species and S = Units of space or area (no. of quadrats).
5. The population density can be determined by marking quadrats of suitable size and recording the number of individuals of each species occuring in the quadrat.
6. $$\text{Population density} = \frac{\text{Total number of individuals of a species in all the quadrats studied (N)}}{\text{Total no. of quadrats studied (S)}}$$
7. $$\text{Percentage frequency (F)} = \frac{\text{Total number of quadrats in which species occurred}}{\text{Total no. of quadrats studied}} \times 100$$
8. $$\text{Abundance (A)} = \frac{\text{Total number of individuals of species}}{\text{No. of quadrats in which species occurred}}$$

Requirement :

Meter scale, string, nails, paper, pencil, etc.

Procedure :

1. With the help of nails and string prepare four quadrats of suitable size at number of places randomly. (A quadrat is a squarish geographical area of suitable size used as a unit for study of vegetation)
2. Count the number of each plant species present in every quadrat.
3. Record data in the observation table and calculate population density and percentage frequency of different species by using formula given above.

No.	Plant species	No. of individuals per quadrat					Total no. of individuals in all the quadrats studied (N)	Total no. of quad-rats in which the species occurred (A)	Total no. of quadrats studied (B)	Population density $\frac{N}{B}$	Frequency percentage $\frac{A}{B} \times 100$
		1	2	3	4	5					
1.	Sp. a	10	0	5	12	6	33	4	5	6.6	80%
2.	Sp. b	6	5	4	9	12	36	5	5	7.2	100%

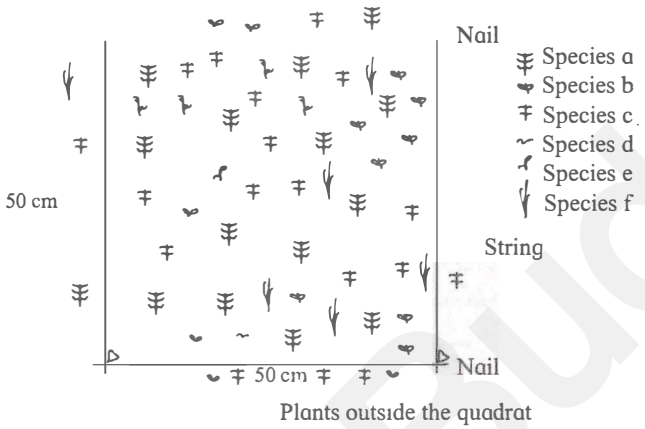

Fig. Digrammatic representation of quadrat 1

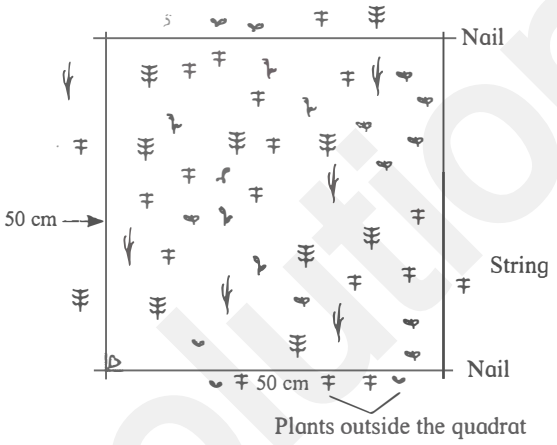

Fig. Digrammatic representation of quadrat 2

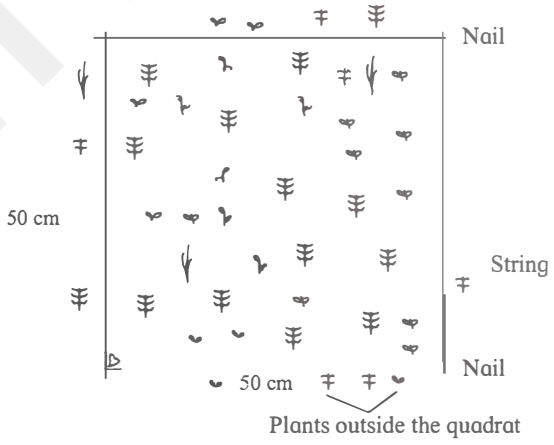

Fig. Digrammatic representation of quadrat 3

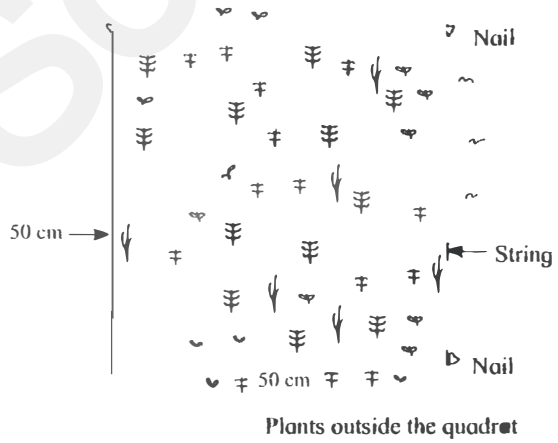

Fig. Digrammatic representation of quadrat 4

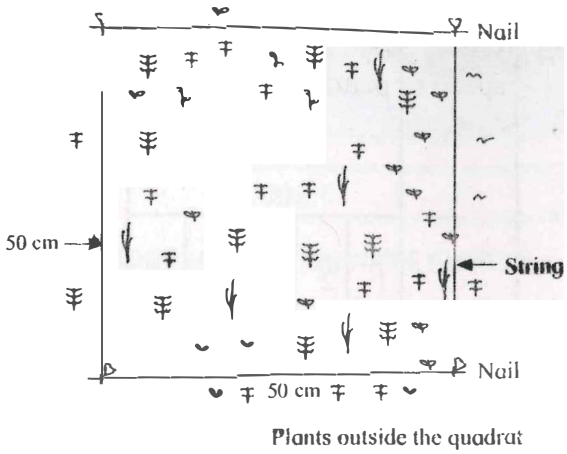

Fig. Digrammatic reprsenation of quadrat 5

Questions

1. What do you mean by population?

Population is the interacting and interbreeding group of organisms present in a perticular area.

2. What is population density? How it can be calculated?

Population density is the number of people per unit of area

Population Density = Number of People / Area.

3. What is a quadrat?

A quadrat is a sample plot of a specific size used for the study of population or a community.

4. How is the frequency percentage calculated?

$$\text{Percentage frequency (F)} = \frac{\text{Total number of quadrats in which species occurred}}{\text{Total no. of quadrats studied}} \times 100$$

5. How to calculate abundance of plant species ? Why it should be calculated in quadrat studies.

$$\text{Abundance (A)} = \frac{\text{Total number of individuals of species}}{\text{No. of quadrats in which species occurred}}$$

Remark and Signature of Teacher .....