

Determination of population density of a hypothetical population by quadrat sampling method

The background of the slide features a soft-focus photograph of a large flock of birds, likely swans or geese, in a natural setting. Some birds are in flight, with their wings spread, while others are on the ground. The overall color palette is warm and muted, with shades of beige, light brown, and pale green, creating a serene and naturalistic atmosphere.

ZOOLOGY HONOURS: SEMESTER I

ZOOACOR02P : Unit 2

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Introduction: Community is an assemblage of species population in which the population is represented by the individual of a species. A central aim of community ecology is to understand how communities are organized by identifying, describing, and explaining general patterns that underlie the structure of communities. Variations in the point diversity of species population can be analyzed by applying certain ecological parameters which reflect importance of different species in a community. Such ecological parameters includes species density, species abundance and frequency.

Species density is the total number of individuals per species, Two communities may be equally rich in species but differ in relative density. Knowing the density and abundance of different species can provide insight into how a community functions. Data on species densities are relatively easy to obtain, and may give insight into less visible aspects of a community, such as competition and predation. For example, observations that two species occur together in many places, yet never co-occur at high densities (when one species is numerous, the other is scarce), suggests that these species compete with each other. Comparing species abundance among communities can be difficult because communities often comprise many different species whose abundance profiles differ widely among the communities.

Requirements:

1. Quadrat (1cm² in measurements)
2. Worksheet
3. Pen and pencil
4. Calculator

Procedure: Present study is based exclusively on a hypothetical community chart based on quadrat sampling. Ten (10) quadrats of 1cm² of size are marked for total counting. Individuals of each species in each quadrat are counted. The observed data are recorded in table-I and data calculated from table-I is reported on table-II. The different ecological parameters are measured by using the following methods.

Components calculating Species abundance with formula :

1. Density (D) = Total individuals of species ÷ Total no. of quadrat studied
2. Abundance (A) = Total no. of individuals of the species ÷ Total no. of quadrat in which the species occurred

Observation: Table –I : Species population diversity by quadrat sampling (provided in class)

Calculation : The values of species density and abundance of hypothetical community study are calculated from Table-I and generated data is given below in

Table-II (calculated during class)

Conclusion:By condensing the information on species densities, they allow for comparisons of how various communities differ in the way they are organized. Contrasting patterns in species density and abundance may similarly indicate differences in the way that communities are organized that there are many rare species and only a few common species. The data generated from hypothetical chart by quadrat sampling method for total counting of species density with abundance, it is concluded that Species a, b and s are common species whereas species r is rare or accidental species.