D II / Hons / Zoology. Paper IV Group-B.

Lecture No - 30

By
Dr. (Mrs) Prabhavati.
Marwari college
4.5.2020.
Prabhavty91@gmail.com.

BIOSTATISTICS

Introduction :-

Biostatistics is made up of two words Bio means life and statics means metry. As its name suggests Biostatistics may be defined as "The use of statistics in biology is known as Biostatistics or Biometry".

The branch of science which deals with techniques or method of collection of Data, classification summarising, interpretation, drawing inferences, testing of hypotheris, making recommendations etc. is called statistics.

Need and scope :-

In biology, most phenomena are affected by many causal factors, uncontrollable in their variation and often unidentical. Statistics is needed to measure such variable phenomena with a predictable error and to ascertain the reality of minute but important differences. The purpose of statistics is not only to collect numerical data but is to provide a methodology for handling, analysing and drawing valid inferences from the data. It has wide application in almost all sciences social as well as physical such as biology, education Psychology, economics, planning, mathematics, business management etc.

Types of Statistics :- Generally two types of statistics are used in biology. There are Sample statistics and Test statistics.

(1) Sample Statistics :- These are generated from data used to estimate population parameters (e.g. mean, standard deviation etc.). Sample statistics are used to define as the nature and distribution of data. Sample statistics provide knowledge as to whether the result is statistically significant or not.

(2) Test statistics :- These are used to test hypothesis about one or more samples of data. The statistical test one choose for analysis is dictated to a great extent by his experimental design, and the type of analysis should be considered when designing the data collection format. Neither the statistical test nor the experimental design should entirely dictate the other, but they should be co-ordinated (eg- x^2- chi square and student's 't' test).

In the language of statistics following notations are used:-

Σ = Summation (Pronounced as Sigma).
% = Percentage.
$\bar{X}$ = Mean.
= = Equal to
> = Greater than
< = Lesser than
∞ = Infinity.
O = observed number.
E = Expected number.
P = Probability.
K = Number or group of classes.
X = Deviation obtained from actual mean.
X' = Deviation obtained from assumed mean.
f = Frequency.

Q = Quartile deviation
MO = Mode
M = Median
MD = Mean deviation
δ = standard deviation
SEδ = St. error or standard deviation
t = Student's 't' test
χ^2 = chi square test
v = variance
i = Length of class intervals
r = correlation coefficient

Important statistical terms & notations used in statistics.

Data :- A set of observation is called data. First step of statistical study is the collection of data. Data collected through personal investigation is called Primary data. In scientific study only primary data is used. Collection of data from secondary sources such as journals, magazines, papers etc. is called secondary data.

Population :- The popular data of population is Universe. But the population in a statistical investigation refers to any well defined group of individuals or of a particular type.

Sample :- Fraction of population drawn by using a suitable method so that it can be regarded as representative of the entire population is called a sample and the number of units in sample is known as the sample size.

Observation :- Measurement of an event is called observation. Haemoglobin % of RBC are event & 14g/100 c.c. and 5.5 lac/mm^2 are measurements.

Variable :- Biological phenomena such as length, weight, age, Hb%, RBC numbers, VO_2 intake, fecundity, personality traits etc. vary in a number of ways. The above mentioned characters are variable which may be defined as "the characteristics on which individuals differ among themselves are called a variable".

Variable can be expressed in three ways :-

(a) Individual series :- Each measurement of variable is independent and are written separately.

(b) Discrete series :- Measurement of variables is represented in repetition i.e. frequency but value of variables vary by infinite 'jumps' or 'breaks'.

(c) Continuous series :- It assume all values within a certain intervals & exhibit no 'jumps' or 'breaks', with repetition number.

Parameter :- The numerical quantities which characterise a population in respect of any variable are called parameter of a population. If the variable is length and measurement of length is taken for a large population of animals or plants of a species, the mean length can be regarded as parameter.

To be continued.