University of Mohamed Khider, Biskra **2026/2027**
TCSNV Department **1** $^{st}year$
Module: Biostatistics

Worksheet N°3: Descriptive statistics

Exercise 1 : In the following biological studies define **sample**, the **variable studied** and its **type**:

1. In an ecological study of the Biskra palm grove, the total population of date palm fruit flies (*Drosophila melanogaster*) is estimated at 30 thousand individuals. To assess the genetic variation in wing length, an entomologist traps at random 150 flies and measures their phenotypic traits under a stereomicroscope.

2. Photosynthetic rate of olive leaves (*Olea europaea*) in drought stress conditions (μmol $CO_2/m^2/s$): 6.0, 8.0, 6.0, 12.0, 10.0, 12.0.

3. An epidemiological investigation evaluates the contamination of 20 freshwater pond stations across the Biskra oasis by the pathogenic water snail (*Bulinus truncatus*). We know that the total number of monitored natural water bodies in the region is 120.

4. Determination of the iris pigmentation (eye color: brown, black, green, blue) in a genetics cohort of 120 biology students sampled from a promotion of 1000 students.

5. Serum total cholesterol concentration (g/L) measured in a laboratory cohort of diabetic mice (*Mus musculus*): 2.10, 2.15, 2.10, 2.03, 2.40, 1.38, 1.15, 2.10.

Exercise 2 : In an immunology and human genetics practical session, blood group typing (ABO and Rhesus factor) was performed on a biological sample of 20 students:

O^+	A^+	B^-	B^+	B^+	O^+	B^+	O^+	O^-	A^+
A^+	O^+	O^-	O^+	O^+	O^+	A^+	O^+	A^+	B^-

1. Determine the biological variable studied and its nature.

2. Determine the sample size (N).

3. Construct and fill the frequency distribution table (absolute frequency n_i, relative frequency f_i).

4. Construct the pie Chart (representing phenotypic distribution as angular slices of a circle).

Exercise 3 : In a botanical genetics experiment on garden pea plants (*Pisum sativum*), a biologist investigates plant fecundity by counting the **number of seeds per pod** across a random sample of 50 harvested pods. The observed values of the biological variable are:

1	1	1	1	1	2	2	2	2	2	2	2	2	3	3	3
3	3	3	3	3	3	3	3	3	3	3	4	4	4	4	4
4	4	4	4	4	5	5	5	5	5	5	6	6	6	8	8

1. Determine the biological variable, the type of variable, and its modalities (x_i).

2. Construct the frequency table including: absolute frequency (n_i), relative frequency (f_i), lesser than cumulative frequency ($F^{\uparrow}$), and more than cumulative frequency ($F^{\downarrow}$).

3. Draw the bar charts (Bar diagram / Diagramme en bâtons) representing the distribution.