

People's Democratic Republic of Algeria
Ministry of Higher Education and Scientific Research
University Echahid Cheikh Larbi Tebessi-Tebessa-
Faculty of Exact Sciences and Sciences of Nature and Life
Department of Sciences of Nature and Life
Handout for 3rd year biology students
(All specialities)

Scientific English

Dr. AMRI Cherine



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Objectives: at the end of this lecture, the student will be able (i) to distinguish between strategies and (ii) to use them.

1. Definition of ESP

Many definition were given to ESP (English for Specific Purpose). It is based on two key criteria : (i) ESP is goal-directed, (ii) ESP courses develop from a needs analysis, which aims to specify what exactly students have to do through the medium of English ^[5]. In addition, ESP was divided into two main fields English for Academic Purposes (EAP) and English for Occupational Purposes (EOP) ^[2]. In the present handout, we will focus on EAP since the target is the university students.

2. What does « reading comprehension » mean ?

It is considered one of the most important skills that a learner of English as a second language needs to master, especially in an ESP class. It is a vital component to reach the goal of the teaching-learning process. Many definitions were given in this context, the fundamental aim of reading is to receive the correct message from a text that the writer intended to convey^[1], and the comprehension is a process in which readers make meaning by interacting with text through the combination of prior knowledge and previous experience, information in the text, and the views of the readers related to the text^[3]. Hence, the objective of this skill is to get an understanding of the text rather than acquire meaning from single words or sentences. Reading comprehension contains three steps namely reading, understanding and remembering^[8]. Furthermore, the reading process contains four elements which are the reader, the text, the fluency and strategies.

3. Why do we read ?

The aim of the reading skill is the comprehension and creating meaning which involves the combination of the reader's background and the information in the text. It is very linked to the motivation of readers in reading (for pleasure or for information).

4. Reading comprehension strategies

During the exam, students find difficulties in « reading comprehension section ». Indeed, they are supposed to read and understand a long text, full of information, for the first time and answer many questions correctly. The duration of the exam is another problem for a student, because other exam sections are await and need to be treated. In order to overcome all these problems and facilitate this task, several strategies can be suggested and must be mastered. This handout is intended for second year students of Sciences of Nature and Life specialities, only two strategies will be discussed: skimming and scanning. It is important to mention that both strategies are quick reading strategies.

4.1. Skimming

This strategy is defined as quick movements of the eyes through the whole passage in order to get the gist or the main idea of this passage. It is utilized when readers wish to cover material in a hurry^[6]. So, skimming strategy helps students to read more actively and to find the general idea of each paragraph without wasting a lot of time. For a researcher, this strategy is very useful to decide whether the material is worth to be read^[7].

There are three (3) methods of skimming^[5]:

- Preview skimming: the readers read introductory information; the heading hand, subheading, and summary if are available.

- Overview skimming: the readers can discover purpose and select the material.
- Survey skimming: the readers will get the general ideas of what the materials contain.

Several steps in applying skimming strategy are suggested^[5]: (i) read the title, (ii) read the first paragraph (§) completely, (iii) read the first sentence of each paragraph, (iv) look for key words, proper nouns, unusual words.

4.2. Scanning

This strategy is also fast reading, it is intended to look for specific information in limited period of time. Scanning is also utilised to decide whether a particular piece of information will answer a given question. Furthermore, this strategy involves the identification of the paragraphs or sections that could contain the information the reader needs and then looks quickly through them vertically; seeking key words^[9].

Generally, three (3) steps are involved in scanning: (i) determine what keywords to look for, (ii) look quickly through the text for these words, (iii) read the sentences around them to see if they provide the information.

In conclusion, skimming and scanning are particular reading strategies, important for fast and effective reading. Skimming is a more accurate activity which is an overview of the text and implies a reading competence whereas scanning is just the opposite of skimming^[4].

Activity 1

Text1

On this planet, living beings interact with each other in multiple ways, including competition, predation, parasitism and facilitation, such as pollination, seed dispersal and the provision of habitat.

Moreover, There are underlying **links between living beings and their physical and biological environment**, which form an interacting and ever-changing system. The human being is a component of these systems. Indeed, in many areas, he is the dominant organism and, **like all other species, he depends on system properties and the network of interactions between organisms and within and between systems for their sustenance.**

These systems are termed « Ecosystems », they are mainly divided into two types: natural ecosystem and artificial ecosystem. The first type exists in nature, and classified into terrestrial and aquatic. Terrestrial includes hot desert, grassland, tropical and temperate rainforest, whereas aquatic includes ponds, rivers, streams, lakes, estuaries, oceans, mangroves, swamps and bays etc. In addition, these two ecosystems are self regulating, open system with a free exchange of inputs and outputs with other systems. The second type is **simple, man-made, unstable and subject to human intervention and manipulation.** They are usually created by clearing part of a forest or grassland, e.g. arable or agricultural land.

Ecosystem function is the capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly. These functions are subset of ecological processes and ecosystem structures. **Each function is the result of the natural processes of the total ecological sub-system of which it is a part.** Natural processes, in turn, are the result of complex interactions between biotic and abiotic components of ecosystems through the universal driving forces of matter and energy. There are four primary groups of ecosystem functions (1) regulatory functions, (2) habitat functions, and (3) production functions.

Above all, the student must remember that :

- ✓ We **skim** to obtain the **main ideas**.
- ✓ We **scan** to obtain **details**.

Skimming steps (under timed conditions):

- (i) Read the title: the title is unknown in text1. So, students will be asked later « which title fits the text best ? » or the teacher will supply several titles to choose the best.
- (ii) Read the first paragraph completely: the 1st paragraph discusses the interactions between organisms and their environment, and the systems they form together.
- (iii) Read the first sentence of each paragraph: the teacher could provide many ideas in a scrambled order and ask the students to match ideas with their paragraphs or let students to do the whole task without help.
 - 1st sentence of the 1st §: organism interaction types.
 - 1st sentence of the 2nd §: ecosystem types.
 - 1st sentence of the 3rd §: ecosystem functions.
- (iv) Look for key words, proper nouns, unusual words: organisms, ecosystems, functions.

Scanning steps (under timed conditions):

The teacher must generate a list of questions.

Q1- Give a definition of the system from the 1st §.

- (i) Decide what keywords to look for: **system**.
- (ii) Look for these words rapidly in the text.
- (iii) Read the sentences related to them to see if they give the information.

Q2- Explain the position of humans among the ecosystem.

- (i) Decide what keywords to look for: **human**.
- (ii) Look for these words rapidly in the text.
- (iii) Read the sentences related to them to see if they provide the information.

Q3- What are the characteristics of artificial ecosystems ?

- (i) Decide what keywords to look for: **artificial**.
- (ii) Look for these words rapidly in the text.
- (iii) Read the sentences related to them to see if they provide the information.

Q4- What does each ecosystem function represent ?

- (i) Decide what keywords to look for
- (ii) Look for these words rapidly in the text.
- (iii) Read the sentences related to them to see if they provide the information.

The answers are colored in the text1.

Activity 2

Text2

Coined by Walter G. Rosen in the year 1986, the word **biodiversity** is related to **diversity or variability of living beings present on the earth**. This term means also the biological diversity which basically indicates the total number of different taxa, living in a particular area such as microbes, plants, and **agriculture**. Throughout human history, thousands of crop species have been identified, developed, used and relied upon for food and agricultural production. By the process of photosynthesis, plants provide us with the oxygen which we breathe and the sugars that give the fuel for life. There is an important variation in the biodiversity, resulting from human and

Questions

1. Which of the following is the main topic of the passage? (I skim)
 - (A) The characteristics of living beings.
 - (B) How living being produce energy.
 - (C) The biodiversity of living beings.**
 - (D) The biodiversity of animals.

2. The plant diversity is the resource for (I scan):
 - (A) Food.**
 - (B) Shelter.**
 - (C) Agriculture.**
 - (D) Minerals.

3. Which of the following are the results of photosynthesis? (I scan)
 - (A) Oxygen.**
 - (B) Hydrogen.
 - (C) Proteins
 - (D) Sugars.**

4. According to the passage, in addition to human and ecosystem interaction, there are other factors that have an impact on biodiversity variations which are (I scan):
 - (A) Pests.**
 - (B) Wind.
 - (C) Droughts.**
 - (D) Diseases.**

5. In line 5, the author defines biodiversity as (I scan):

(A) The number of individuals.

(B) The number of species.

(C) The number of living beings.

(D) the number of ecosystems.

For the 1st question, skimming is the best strategy. We need to read the 1st sentence of each paragraph in order to get the main idea of the text.

- ✓ 1st sentence of the 1st §: appearance of the term biodiversity and its definition.
- ✓ 1st sentence of the 2nd §: Plant biodiversity and its importance.
- ✓ 1st sentence of the 3rd §: Animal biodiversity and its importance.

If we take the main idea of each paragraph, it can be inferred that text talks about the biodiversity of plants and animals. So the best answer of the question number 1 is (C).

For the 2nd question, we know that the 2nd paragraph talks about the plant diversity, we will scan and look for the keyword « resource », then glance specifically at that word through the text. Hence, the correct answers are (A), (B) and (C).

Moreover, the remaining questions were also answered using a scanning technique that searches the entire text for specific information.

Objectives: at the end of this lecture, the student will be able (i) to write a scientific paragraph.

1. Definition of a paragraph

Paragraph by definition is a set of sentences that develop one single topic. Hence, the writer's main idea will be explained by the sentences of a paragraph. It is quite understood that in each paragraph only one topic is being discussed and the discussion of more than one topic is not acceptable. In academic writing, a paragraph contains between five (5) to ten (10) sentences, it can be shorter or longer though, according to the topic^[12].

Activity 1. Let's observe the paragraph below:

« **The plasma membrane** is a semi-permeable barrier, allowing some substances to pass through more easily than others ; this is the so called selective permeability. ~~Vesicular system is responsible for the transport of all products of the cell.~~ Lipids are responsible for the structure of the plasma membrane, while proteins and sugars are involved in its activities. These include membrane transport and intercellular communication ».

While reading this paragraph, you will discover that there is an odd sentence. Indeed, the topic sentence discusses the plasma membrane, the 2nd sentence talks about vesicular system though, which is irrelevant and must be omitted.

2. Paragraph organization

The English writing organization style is very simple, which has a beginning, a middle and an end. Thus, an academic paragraph has a particular organizational pattern (Fig.1) which facilitates the understanding for the readers. This pattern comprises three (3) parts: (i) a topic sentence, (ii) supporting sentences, (iii) a concluding sentence^[11].

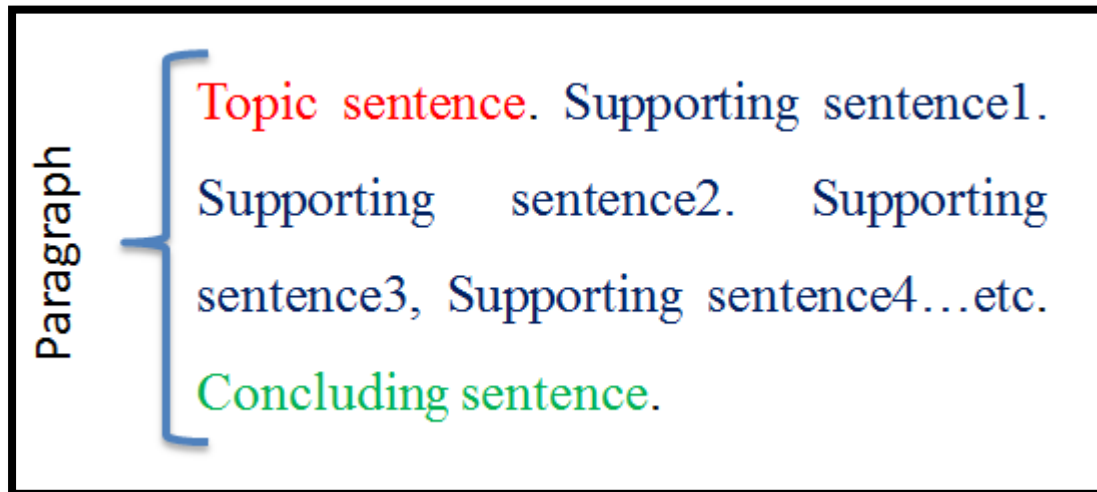
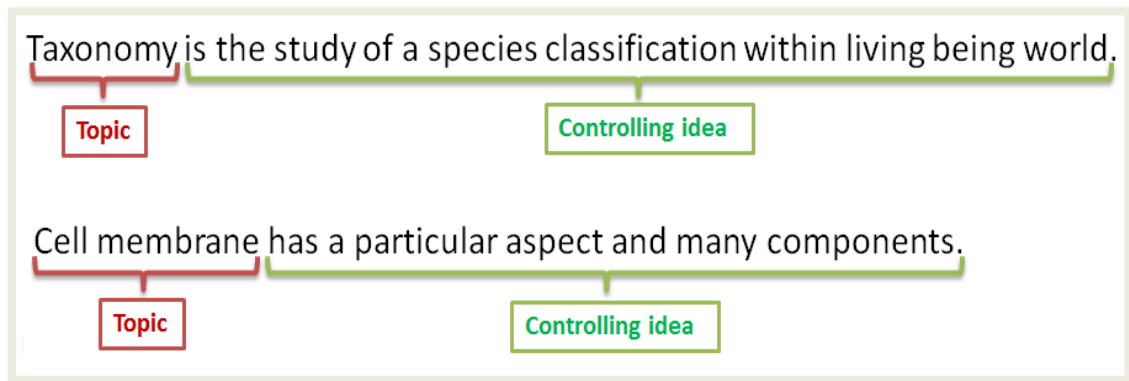


Fig.1. Academic paragraph pattern.

2.1. Topic sentence

This sentence introduces the topic of a paragraph to the reader by stating the main idea and is thereby the most important sentence in the paragraph, and usually comes first in a paragraph. The topic sentence contains two (2) parts, which are the topic and the controlling idea. The topic is a word or a phrase, which provides readers what the entire paragraph is going to be about, and the controlling idea indicates what the author wants to say about the topic. Controlling idea is further required to limit the topic^[11, 12].

Activity 2. Let's study the sentences below:



When a student writes a topic sentence, he ought to: (i) state the main idea of the paragraph as clearly and as accurately as possible, (ii) avoid to make the topic sentence too general or too specific.

Activity 3. Let's observe the sentences below:

*Taxonomy is the study of classification. → Too general X

*Taxonomy is the study of a species classification within living being world, each species is designated by the name of the genus, followed by a specific adjective in Latin. → Too specific X

The best is to say:

✓ Taxonomy is the study of a species classification within living being world.

2.2. Supporting sentences

The next step, after the student has chosen a topic and written a topic sentence, is to develop the main idea of the paragraph by providing more information. There are three (3) important ways to achieve this step^[12]:

- Giving details: they are general points that tell more about the main idea.

- Giving explanations: they tell the reader about the meaning.
- Giving examples: they are specific events, things,...etc that support the main idea of the paragraph.

Activity 4. Let's add supporting sentences to the following topic sentence:

Topic sentence

Taxonomy is the study of a species classification within living being world.

Supporting sentence1: **details**

The best-known classification in the history of biology is Linnaeus', termed also systematic classification, who proposed designating a species by the name of the genus, followed by a specific adjective in Latin.

Supporting sentence2: **Example**

So Felis domesticus designating the domestic cat, and Felis cactus designating the wild cat.

Supporting sentence3: **explanation**

Linnaeus' classification is based essentially on morphological characters (similarities and differences), and follows the hierarchy of ranks: species, genus, class, order, phylum, kingdom, ... etc.

There are two (2) types of supporting sentences^[10]:

- Major supporting sentences: they support the topic sentence in a paragraph.
- Minor supporting sentences: they support the major supporting sentences.

Activity 5. Let's observe the sentences below:

Topic sentence

Cell membrane has a particular aspect and many components.

Major supporting sentence1: the cell membrane aspect

Under the electron microscope, the cell membrane has a trilamellar appearance: two dark dense bands, each 2.5 nm thick, separated by a light band 3 nm thick.

Minor supporting sentence: talks about the content of the outer band of the cell membrane not the cell membrane aspect.

The outer dense band contains fine fibrils on the extracellular side; this is the cell coat, also known as *glycocalyx* due to the presence of carbohydrate, and corresponds to membrane receptors and extracellular matrix elements.

Major supporting sentence2: the cell membrane components

The cell membrane is highly heterogeneous in space and time, it is composed of three essential elements: lipids, proteins and carbohydrates.

Minor supporting sentence: talks about lipids only.

Phospholipids are the most abundant membrane lipids. Each one comprises a glycerol molecule, two alcohol groups of which are esterified with two fatty acids and the 3rd with phosphoric acid.

2.3. Concluding sentence

The concluding sentence is the the final sentence of a paragraph and it is optional. It should not introduce a new idea and can be written in two ways: (i) restating of the topic sentence in different way, (ii) summarizing all major supporting sentences. It may start with a transition such as in short, all in all, in conclusion, in summary^[11, 12].

Activity 6. Let's add a concluding sentences to the following paragraph:

Paragraph

Taxonomy is the study of a species classification within living being world. The best-known classification in the history of biology is Linneaus', termed also systematic classification, who proposed designating a species by the name of the genus, followed by a specific adjective in Latin. For example, *Felis domesticus* designating the domestic cat, and *Felis cactus* designating the wild cat. Moreover, Linnaeus' classification is based essentially on morphological characters (similarities and differences), and follows the hierarchy of ranks: species, genus, class, order, phylum, kingdom, ... etc.

Concluding sentence: by restating the topic sentence

All in all, taxonomy allows to distinguish between animals, plants, bacteria,...etc, and to recognize the position of each among the living being wold.

Concluding sentence: by summarizing the supporting sentences

In short, taxonomy is a discipline that permits to provide a name to a species, according to its morphology, folowing specific taxonomic ranks.

3. Types of paragraphs

Actually, there are many types of paragraphs. Since this handout is intended for students of biology, we will focus on two types, which are descriptive paragraph and expository paragraph.

3.1. Descriptive paragraph

In biology, we need all the time to describe biological processes or phenomena, organs, tissues, biochemical reactions,... etc. Let's take an example about the description of a cell. First of all, student needs to use space order, he must chose the direction of the description which is not changeable, in other words, from inside the cell to outside or *vice versa*. Secondly, the usage of preposition of place in this case is so recommended in developing the space order *e.g.* above, around, behind, below, between, inside, in front of, next to, on, under^[11].

Activity 7. Let's observe the paragraph that describes a cell:

The cell is the fundamental unit of an organism. It is surrounded by the plasma membrane, which separates the inside of cell, occupied by a liquid termed cytosol, from the outside of the cell. Immediately below the plasma membrane, there is a network of short actin microfilaments associated with complex molecules that anchor the cytoskeleton to the membrane. In the center, we find a nucleus next to which the endomembrane system is located. The rest of the organelles such as mitochondria, ribosomes, plasts, peroxisomes have various location in the cell.

Let's take another example about the description of biological process. In this case, student needs to use time order *e.g.* first, next, after that, finally.

Activity 8. Let's observe the paragraph that describes a biological phenomenon termed "Phagocytosis":

Phagocytosis involves the internalization and the transport of solid particles like bacteria across the plasma membrane to intracellular environment. First, through chemotaxis, macrophages migrate to areas occupied by bacteria, attracted by chemical substances. Next, the plasma

membrane of macrophages emits pseudopods which surround the bacterium and internalize them, forming a phagosome. After that, the formed phagosome fuses with lysosomes to give a phagolysosome, inside which the phagocytosed bacterium is degraded. Finally, after eating the bacterium, the products resulting from this degradation are expelled to the outside by Exocytosis.

3.2. Expository paragraph

In this type of paragraphs, the student explains something. There are different ways by which topics can be explained; one common way of this is by providing examples. As space order is important in descriptive paragraph, logical order is very important in expository paragraph. The order to the major supporting sentences must be respected, because the logics are different from one person to the other^[11].

Activity 9. Let's observe the paragraph that explains the "cell wall" in the plant cell:

The cell wall is the hard outer layer that protects the plant cell. It is mainly carbohydrate-based and comprises three major classes of polysaccharides: cellulose, hemicellulose and pectin. In addition, there are important structural proteins as well as phenolic and aliphatic polymers. The plant wall provides mechanical resistance to the plant body, enabling vertical growth and structure formation. Hence, it plays an important role in cellular processes such as cell expansion, tissue differentiation, intercellular communication, water movement and defense against pests and pathogens.

4. Characteristics of a good paragraph

- **Paragraph layout:** in order to indicate where a paragraph begins and ends, two (2) methods are suggested ; either by indentation or by leaving a space between paragraphs.

Activity 10. Let's observe the paragraphs below:

Separating paragraphs by indentation

Lysosomes are key organelles in the degradation of a variety of biomacromolecules in the animal cell. The degradative function of lysosomes is performed by over 60 hydrolases, with specificity for different substrates. Since the pH of these hydrolases is highly acidic, lysosomes have the particularity of containing the most acidic microenvironment (pH = 4.5-5.0) within cells.

Plants and fungi have a different class of organelles: vacuoles, which are closely related to lysosomes. These vacuoles are larger than lysosomes, occupying over a third of the plant cell's total volume.

Separating paragraphs by leaving a space

Lysosomes are key organelles in the degradation of a variety of biomacromolecules in the animal cell. The degradative function of lysosomes is performed by over 60 hydrolases, with specificity for different substrates. Since the pH of these hydrolases is highly acidic, lysosomes have the particularity of containing the most acidic microenvironment (pH = 4.5-5.0) within cells.

Plants and fungi have a different class of organelles: vacuoles, which are closely related to lysosomes. These vacuoles are larger than lysosomes, occupying over a third of the plant cell's total volume.

- **Paragraph coherence:**

The paragraph is coherent when all the supporting sentences are in good order. In expository paragraph, coherence is based on logical order, and the transitions of example and logical order help us to be coherent in writing^[11]. To improve coherence, we need to create an outline, before we write, containing the topic sentences, supporting ideas, examples, reasons, ...etc.

- **Paragraph unity:** as mentioned before, a paragraphs should have unity, that is, it should only contain one idea. If there is more than one idea, a new paragraph could start^[11].
- **Paragraph cohesion:** a paragraph has cohesion when all the supporting sentences connect to each other. The methods of connecting sentences to each other are called cohesive devices. Four important cohesive devices are suggested : (i) connectors *e.g.* however, moreover etc, (ii) definite article *e.g.* the, (iii) personal pronouns *e.g.* he, him, his, etc, and (iv) demonstrative pronouns *e.g.* this, those, etc^[9].

Good cohesion is acheived through three (3) main methods :

*Reference words: words which do not make sense in their own *e.g.* this, that, those, it, they, them, he, she, which...etc.

Activity 11.

~~Peroxisomes~~ are characteristic of all Eukaryotic cells. ~~Peroxisomes~~ are the simplest cellular organelles, ~~Peroxisomes~~ resemble glycosomes in parasites, such as trypanosomes, and glyoxysomes in plants. The most important feature ~~of Peroxisomes~~ is the metabolic enzymes that generate hydrogen peroxide (H₂O₂). ~~Peroxisomes~~ are only found in certain cell types *e.g.* in mammals, peroxisomes are found mainly in liver and kidney cells.

*Repeated words: in a passage, words or phrases expressing the same idea can be found.

Activity 12. Words and phrases of the same color represent the same idea.

Peroxisomes are characteristic of all Eukaryotic cells. They are the simplest cellular organelles, which resemble glycosomes in parasites, such as trypanosomes, and glyoxysomes in plants. Their most important feature is the metabolic enzymes that generate hydrogen peroxide (H_2O_2). Another key aspect is the β -oxidation of fatty acids and the production of acetyl groups. They are unique to certain cell types e.g. in mammals, peroxisomes are found mainly in liver and kidney cells.

*Transition words: they are words which signal relationships between ideas.

Table1. Some English transition words for writing.

Emphasis	Addition	Contrast	Order
Obviously	Moreover	Unlike	First/Firstly
In particular/Particularly	Furthermore	Nevertheless	Finally
Especially	Too	Despite/in	Above all
Clearly	Also	spite of	Before
Absolutely	Besides	In contrast to	Last but not
Definitely	In addition	Whereas	least
Indeed	As well as that	Even so Conversely	

Activity 13. Words written in blue are transition words.

Peroxisomes have many features. **First**, they are characteristic of all Eukaryotic cells and are the simplest cellular organelles. **Second**, they contain the metabolic enzymes that generate hydrogen peroxide (H_2O_2). **Furthermore**, the β -oxydation of fatty acids and the production of acetyl groups represents another key aspect. **Finally**, they are unique to certain cell types e.g. in mammals, peroxisomes are found mainly in liver and kidney cells.

Objectives: at the end of this lecture, the student will be able (i) to learn some paraphrasing techniques, (ii) to apply them in his writing, and (iii) to summarise scientific texts.

1. Paraphrasing

Generally, the academic writing is a formal language that provides knowledges derived from study findings . Paraphrasing is one of the most important strategies for enhancing writing skills. By definition, it is making changes to the original text and preserve its meaning^[13]. A good paraphrase possesses four essential characteristics^[14]:

- Through: when paraphrasing, student should leave out unimportant details such as examples and explanations.
- Accurate: the paraphrase must only reflect the exact words of the author.
- Fair: for many reasons, paraphrases are considered unfair. However, this problem can be avoided by conducting a thorough and critical reading of the original material.
- Objective: the paraphrase should not contain one's own point of view on the topic or on the original text quality.

If the paraphrased passage is not documented or does not include the source of the information, it is considered plagiarism.

1.1. Importance of paraphrasing

This strategy is an essential academic writing for many reasons. Firstly, it improves the ability of the student to understand by analysing the grammatical structure. Secondly, the student can rewrite the original idea by his own wording. Thirdly, the student prevents plagiarism, which represent the first enemy of good academic writing^[14].

1.2. Paraphrasing strategies

After carefully reading, student can employ several ways in order to paraphrase a text. In this handout, we will focus on five (5) easy techniques which are: (i) changing words, (ii) changing the voice, (iii) citation switch, (iv) concept of binary, (v) changing parts of speech.

1.2.1. Changing words

This technique means to replace the original words with synonyms. Nevertheless, synonyms must be accurate and convey the same meaning of the original passage^[14].

Activity 1. Let's paraphrase the passage below by using the changing words technique:

Original: the pancreas is an organ located in the abdomen. It plays an essential role in converting the food we eat into fuel for the body's cells.

Paraphrase: the pancreas is a tissue situated in the abdomen. It plays an important role in transforming the food we consume to fuel for the organism's cell.

1.2.2. Changing voice

Student may be able to change a sentence written in the active voice into a sentence written in the passive voice and *vice versa*^[14].

Activity 2. Let's paraphrase the passage below by using the changing voice technique:

Original: the pancreas plays an essential role in converting the food we eat into fuel for the body's cells.

Paraphrase: an essential role in converting the food we eat into fuel for the body's cells is played by the pancreas.

1.2.3. Citation switch

The citation is to add the source or the reference of information provided in your paper. The way of writing this citation can be utilized in paraphrasing.

Activity 3. Let's paraphrase the passage below:

Original: the pancreas plays an essential role in converting the food we eat into fuel for the body's cells (**Author x, 1980**).

Paraphrase: Author x (1980) reported that the pancreas plays an essential role in converting the food we eat into fuel for the body's cells.

Or : according to Author x (1980), the pancreas plays an essential role in converting the food we eat into fuel for the body's cells.

1.2.4. Concept of binary

This method looks for opposites that suit the sentence meaning.

Activity 4. Let's paraphrase the passage below:

Original: the pancreas is an **important** organ in converting the food we eat.

Paraphrase: the pancreas is **not** an **optional** organ in converting the food we eat.

Or : according to Author x (1980), the pancreas plays an essential role in converting the food we eat into fuel for the body's cells.

1.2.5. Changing parts of speech

In this technique, words of the sentence will be replaced by other parts of speech; for example a noun can be changed to use the verb or the adjective form of the word^[14].

Activity 5. Let's paraphrase the passage below:

Original: the pancreas is an important organ in **converting** the food we eat.

Paraphrase: the pancreas is an important organ which **converts** the **eaten** food.

2. Summarising

2.1. Definition

By definition, summarising is reducing text to one-third or one-quarter its original size, clearly repeating the author's meaning, and keeping main ideas. It is one of the most important academic writing skills for students to show the reading comprehension ability and to improve it. Furthermore, summarising process helps student to enhance his acquisition of second language reading comprehension skills. The purpose of a summary is to provide readers with an overview of essential details or interesting information, without citing a personal opinion. Hence, a good summary should be comprehensive, concise, coherent, and independent^[15].

2.2. Steps of summary writing

To write a good summary it is important to thoroughly understand the text you are working with. Here are some suggested steps in writing a summary^[16]:

- Skim the text: take in consideration the subheadings. If there are no subheadings, divide the text into sections or paragraphs.
- Read the text: it allows to highlight essential points and to take notes.
- Paraphrase: rewrite the main points of each section or paragraph by using your own words and do not copy sentences from the original text.
- Write the main ideas: do not include minor details.
- Avoid personal comments and opinion.

- Maintain cohesion (words and sentences) and coherence (progression of ideas) in your summaries.

3. Differences between paraphrasing and summarising

Table2. Paraphrasing vs. Summarising^[14].

<u>Basis of comparaisn</u>	<u>Paraphrasing</u>	<u>Summarising</u>
<u>Meaning</u>	It is taking someone else's words and putting them in one's own word without changing the original meaning.	It is shortened version of the original text.
<u>Focus</u>	Simplification and Clarification.	Central idea
<u>Length</u>	Almost similar length.	Shorter.
<u>Obdjective</u>	To make the author's work easy to understand and to avoid plagiarism.	To simplify the importance of someone else's work while avoiding the inclusion of details and plagiarism.

Objectives: at the end of this lecture, the student will be able (i) to define plagiarism, (ii) to recognise the plagiarism types, and (iii) to avoid plagiarism in his scientific writing.

1. Definition

Derived from Latin word “*plagiarius*” which means “kidnapper,” who abducts the child, plagiarism was defined as the act of using words, ideas, or information from a source without mentioning it^[17]. It is stated to be a serious crime of academia, since it is an act of forgery, piracy, and fraud^[18].

2. Forms of plagiarism

- Verbatim plagiarism: when a writer submits someone else’s words without even acknowledging him publically *e.g.* copy and paste from a published work without referencing is the most known form of verbatim plagiarism. This type of plagiarism is commonly encountered in introduction and discussion section of articles^[17].
- Mosaic plagiarism: it is mixing ones own words in someone else’s ideas. It is copying/pasting in patchy manner^[17].
- Paraphrasing: rewriting a passage in your own words does not make it yours. So to avoid plagiarism you must add the reference^[19].
- Self-plagiarism: unlike the previous types, this type of plagiarism involves dishonesty but not intellectual theft. Authors just increase the number of published works without scientific reasons. Several types of self-plagiarism can be distinguished^[20]: (i) redundant publication, when a researcher submit the same manuscript to many journals, (ii) augmented publication, when a researcher modifies a little an previous published work and republish it, (iii)

segmented publication, when many papers from the same original work are published, (iv) text recycling, when a researcher utilizes large portion a published work in his new publication.

3. Strategies to avoid plagiarism

While some students plagiarize intentionally, other students commit plagiarism unintentionally, simply because they ignore forms of plagiarism. Here some common mistakes that conduct to plagiarism^[21]:

- Lack of references: student forgets to provide corresponding references. There are many styles of referencing, the common ones are: Harvard referencing system (author, date system) and Vancouver referencing system (numeric system).
- Incorrect in-text citation or reference: for example the student misspell the author's name or the publication year is wrong.
- Incomplete in-text citation or reference: this happens when the paragraph is long, and contains many ideas coming from different authors.
- Self-plagiarism.

In order to avoid plagiarism and do not fall in this pitfall, we need to use strategies and techniques^[22]: (i) paraphrase appropriately, (ii) Summarize effectively, (iii) organize sources and references, (iv) write and describe references correctly.

4. Detecting plagiarism

Generally, detecting plagiarism is difficult, however, information technology has made available few websites which can detect and catch plagiarism^[23]:

- ✓ www.ithenticate.com
- ✓ www.turnitin.com
- ✓ www.plagiarism.org

Furthermore, reviewers and readers can detect plagiarized works due to their familiarity with published material in their area of interest.

5. Academic punishment for plagiarism

Overall, plagiarism is not punished by law but rather by institutions even though it is considered an academic crime and a serious ethical offense. Indeed, professional associations, educational institutions, and publishing companies can pose penalties, suspensions, and even expulsions of authors.

In Algeria, according to order N° 1082 of 27 December 2020 laying down rules on preventing and combating plagiarism we have:

- In the case of student: any act of plagiarism relating to the scientific and teaching work required of students in their bachelor's, master's and magister's degree dissertations and doctoral theses, whether before or after their defense, shall render the author liable to the annulment of the defense or the withdrawal of the title acquired.
- In the case of teacher: any act of plagiarism in relation to the scientific and teaching work claimed by the teacher-researcher, the university hospital teacher-researcher and the permanent researcher in the course of teaching and scientific activities, the magister's dissertations and doctoral theses and other research projects or university accreditation work, or any other act of plagiarism and other research projects or university accreditation work, or any other scientific or educational scientific or educational publication, duly noted, during or after the defense, publication or its publication or presentation for assessment, exposes its author to the cancellation of the defense, or to the withdrawal of the title acquired or to the cancellation or withdrawal of the publication.

Objectives: at the end of this lecture, the student will be able (i) to know the IMRAD structure, (ii) to analyse a scientific article of biology written in English.

1. Overview

An article presents new information found through researches and experimentations. People like professors, doctors, scientists and other highly educated professionals write article. There are three (3) types of articles^[27, 28]:

- Research paper or original paper: it gives *original results* of a study obtained after many experimentations.
- Review paper: it is a *state of art* of a given problem or topic. So, no need to experimentations, but must suggest the author point of view or analysis about a topic.
- Research note: it is a small research paper (not more than 3 pages).

***What** are the purposes of writing an article ?

A scholarly article has several purposes: (i) share knowledge gained with other researchers, (ii) show how your study fits into current sciences and (iii) inform the public and the scientific communities about important scientific activity.

***Why** do we read articles ?

- To keep abreast of current events.
- To read more about our research topic.
- To acquire detailed information.

***Why** is it worth knowing the academic article's anatomy?

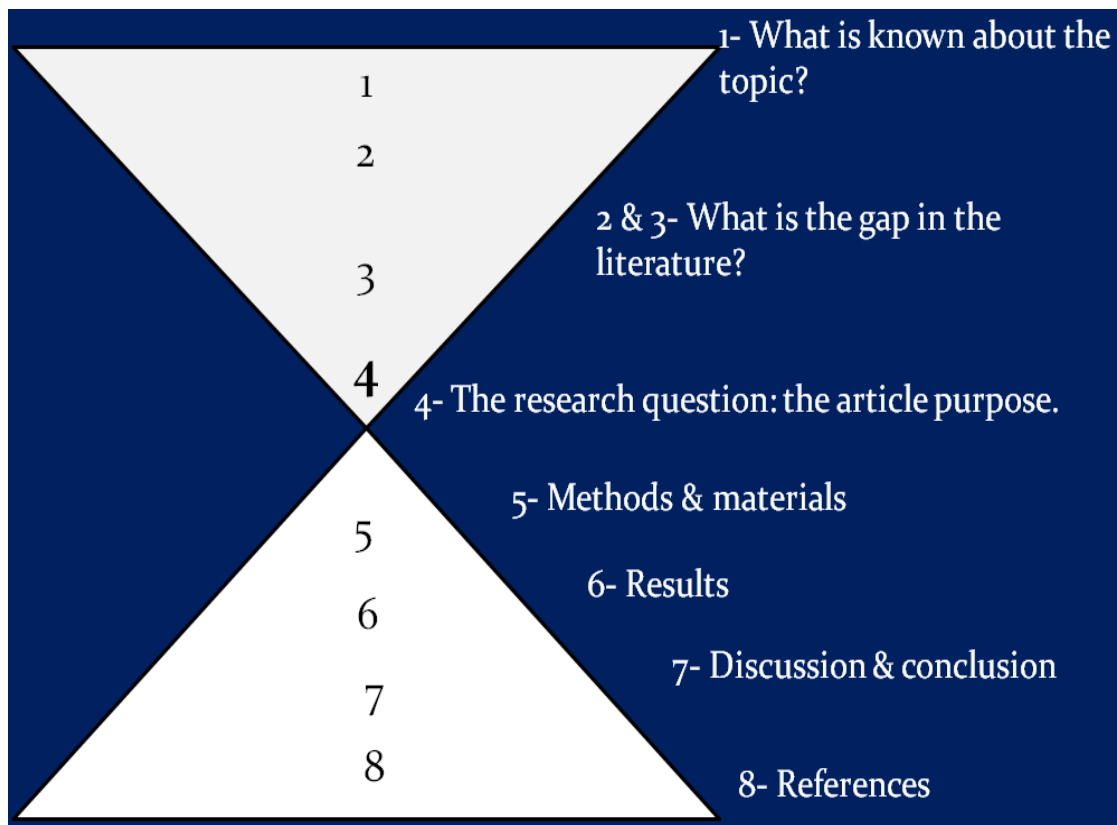
Articles are the foundation of researches, they can be difficult and intimidating. So, knowing their skeleton will save you time and efforts.

2. Basic pattern of a research article

In biology, most journals require research paper to use *IMRD* structure: **I**ntroduction, **M**ethods, **R**esults, **D**iscussion. However, other structures, not used in biology, exist such as:

- OPERA structure: **O**bservation, **P**roblem, **E**xperimentation, **R**esults, **A**ction.
- ILPIF structure: **I**ntroduction, **L**iterature, **P**roblem, **I**mplication, **F**uture.

Hence, research papers written in IMRD structure; follow a basic pattern which is: Header, Introduction, Methods and materials, Results, Discussion, Conclusion, References^[28].



2.1. Header

contains the basic information a researcher needs^[27, 28]:

- ✓ The title of the article.
- ✓ The authors: names and affiliations.
- ✓ The citation information: title of the journal, volume and issue number, day, number of pages.
- ✓ The abstract.

Activity 1. Look at this example:

The image shows a screenshot of a scientific article header from the Journal of Asia-Pacific Entomology. On the left, a dark blue vertical bar contains white labels with red arrows pointing to specific parts of the article header. The labels are: 'Date, volume, number of pages' (pointing to the top right), 'Title of the journal' (pointing to the journal title), 'Title of the article' (pointing to the article title), 'Authors' (pointing to the author names), 'Affiliations' (pointing to the institutional addresses), and 'Abstract' (pointing to the abstract text). The article header itself includes the journal title 'Journal of Asia-Pacific Entomology', the volume and issue information '22 (2019) 766-777', the Elsevier logo, the article title 'Diversity and phenology of hoverflies (Diptera: Syrphidae) in pine forests (Pinus halepensis Miller) of Algeria', the authors 'Siheem Djellab^a, Nadjoua Mebarkia^a, Souad Neffar^{a,*}, Haroun Chenchouni^{a,b}', and the affiliations '^a Department of Natural and Life Sciences, Faculty of Exact Sciences and Natural and Life Sciences, Larbi Tebessi University, 12002, Tébessa, Algeria' and '^b Laboratory of Natural Resources and Management of Sensitive Environments "BNAMS", University of Oum-El-Bouaghi, 04000, Oum-El-Bouaghi, Algeria'. The abstract text is also visible, starting with 'Hoverflies are good indicators of ecosystem integrity, especially in drylands. However, the key factors explaining hoverfly diversity in North African forest ecosystems are still not addressed. The current study provides data on the diversity, structure and functional trophic groups (FTG) of the hoverfly community in Aleppo pine forests under a semi-arid climate in northeastern Algeria. Using an entomological net, hoverflies were sampled weekly during 2008-2009. Alpha and beta-diversity of hoverflies and functional trophic group (FTG) were analyzed using several parameters and indices (e.g. species composition, richness, occurrence, diversity, estimations, similarity, etc.). In total, 602 individuals of 21 species were collected with a constant species (Epeodes corollae) and four common species (Episyrphus hellebrandi, Chrysotoxum intermedium, Eristalis arbutorum and Eristalis tenax).'

2.2. Introduction

This section contains^[27, 28]:

- ✓ The main idea.
- ✓ The research question.
- ✓ The hypotheses and the objectives.
- ✓ Uses primary literature and summarizes the current understanding of the problem.

2.3. Materials & methods

This section informs about testing the study hypotheses^[27, 28]:

- ✓ How the author did the study step-by-step ?
- ✓ Describe all materials & methods of experimentation.
- ✓ What is the analysis performed ?

2.4. Results

This section represents the gist of the different performed experimentations, Indeed, it displays the important findings of the authors' study that help to answer your research question^[27, 28].

2.5. Discussion

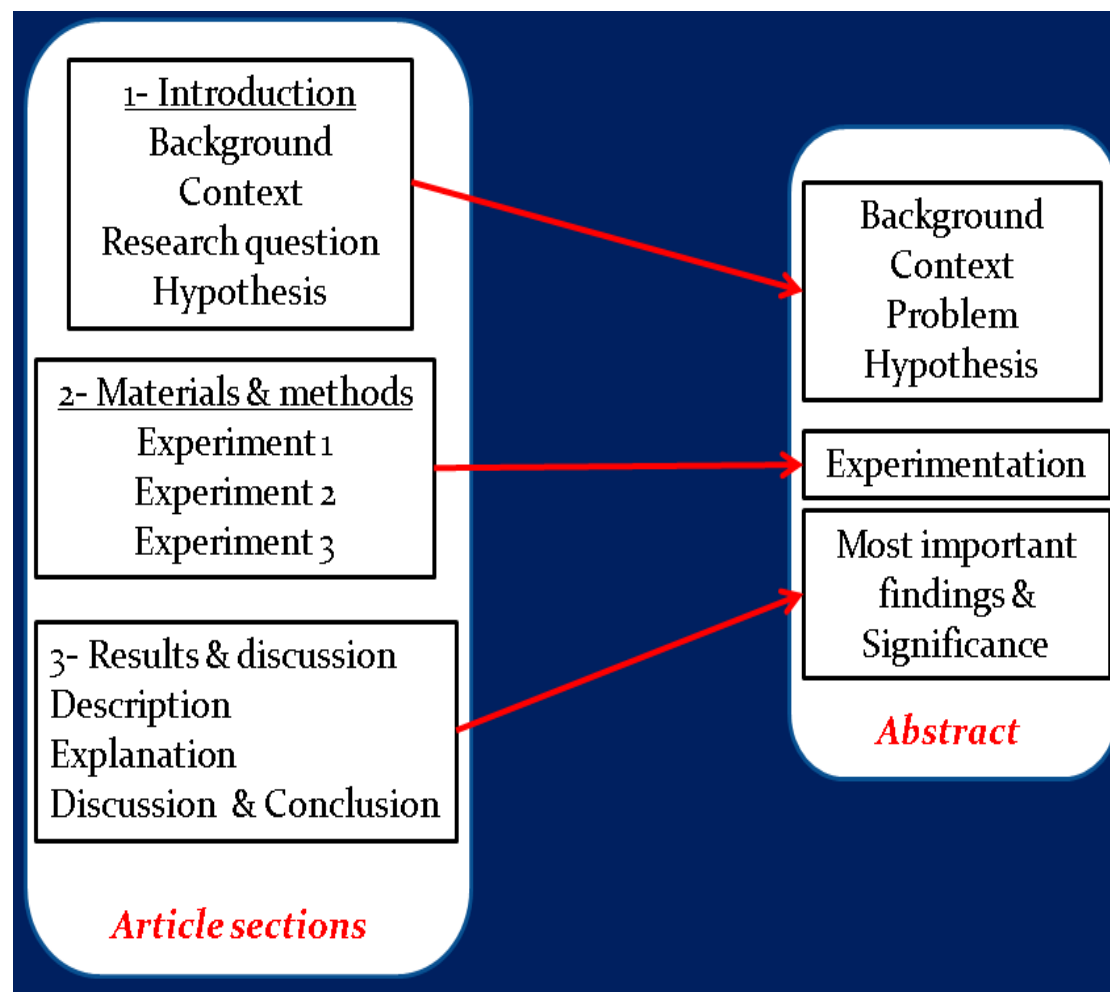
- ✓ Explains what your findings mean.
- ✓ The implication to the authors' area of study and the related fields.
- ✓ Includes limitations of the study and discuss possible future research for improvement.

2.6. Conclusion & references

The conclusion recaps the article and includes the overall from it. However, in references, all information sources used and cited during the study are stated according to a particular referencing system *e.g.* APA system (the most used in biology) [27, 28].

2.7. Abstract

- It must be able to be read independently from the rest of the article: understandable in itself.
- It must allow, in a few words, to understand: the context, the research question, the hypotheses, the solutions, the perspectives,...etc.



Activity 2. Look at this example :

Description of the subject	The key factors explaining the carabid beetle diversity in salt wetlands are poorly revealed. The purpose of this study is to provide, on one side, data on the different levels of diversity (alpha and beta), on the other side, the structure and the functional traits of the carabid community, in wetlands of the semi-arid bioclimatic stage, of Eastern Algeria. The sampling was undertaken during a whole year from November 2016 to October 2017. Systematically, by using 96 pitfall traps, a ground beetles inventory was carried out fortnightly. Structure and diversity parameters (species richness, diversity, estimation of richness and similarity), and functional traits (dispersal power, biogeographic type, body size, humidity requirement and diet) were analyzed. The catches totalled 1121 individuals belonging to 42 species, 24 genera and 12 subfamilies. The most species rich subfamily was Harpalinae with 14 species (33.33 % of total), however, the most abundant subfamily is Brachininae with 469 individuals (41.83 %). Statistically, the spatiotemporal effect is significant on the assemblages abundance and specific richness. Functional trait analysis revealed the dominance of medium-sized species (> 55%), with high dispersal capacity (> 95%), high affinity for humidity (52%) and a zoophagous diet (> 60%). The substantial biodiversity of the carabidofauna encountered in this kind of ecosystems, requires their protection against the irrational anthropogenic exploitation.
Objectives	
Methods	
Results	
Conclusion	

Objectives: at the end of this lecture, the student will be able to write letters and emails professionally.

1. Writing letters

Writing a letter is one of the most important ways of communication between people who are distant from one another. It was the only means of contact in earlier times before the invention of the telephone and the internet. Writing a letter is essential skill that need to be developed and enhanced. There are two (2) types of letters: personal (informal) letters and formal letters.

1.1. Parts of a letter

For all kinds of letters, there is a general format (Fig.2) that should be followed. So the main elements of a letter are^[24, 25]:

➤ The writer's (sender's) address

The first and family name, house number, street, city or town, area code, country. The first letter of each word is capitalized. No punctuation in the address.

➤ Date

There are different formats for dates :

- ✓ In the UK is DMY (date month year = 20 December 2023).
- ✓ In the US is MDY (month date, year = December 20, 2023).

➤ The receiver's address

The first and family name, house number, street, city or town, area code, country. The first letter of each word is capitalized. No punctuation in the address.

➤ **Subject**

It is an optional element and determines the aim of your letter in the brief. It can be in bold, uppercase or both to make it clear.

➤ **The salutation to the addressee (receiver)**

We have two (2) cases: (i) if you know the name of the person to whom you are addressing you may start your letter as follows: Dear + Title + family name, *e.g.* Dear Mr Hamadi. We can use the following titles in salutation: Mr – for a male, Mrs – for a married female, Miss – for an unmarried female, Ms – for a female whose status is unknown, Dr – for a person with the status of a doctor, (ii) if you do not know the name of the person that you are writing to, use the following salutations: Dear Sir or Dear Sirs – for a male addressee, Dear Madam – for a female addressee.

➤ **The body of the message**

This part is the most important elements of the letter. It includes the message of the sender. In a personal letter, the body can be long and detailed containing as many feelings, experiences, advices, news... etc, whereas in a formal letter, it is best to use short, clear, logical paragraphs to state your subject.

➤ **The closing words or phrases**

In formal letters, this section depends on the salutation. If you know the name of the addressee and use the salutation 'Dear Mr Jones' the valediction is « Yours sincerely » or « Sincerely ». If the receiver is unknown and you use the salutation 'Dear Sir /Madam', the valediction is « Yours faithfully », « Yours sincerely », « Sincerely yours ». For extremely formal letters *e.g.* for professors, we use « Respectfully » or

« Respectfully yours ». In addition, when the receiver is of a higher status than the sender we can use « Very truly yours ». In personal letters, you may close the letter with « Yours Lovingly », « Your truly », « Your affectionately ». We often use « Regards », « Kind regards » and « Best regards » which are a semi-formal valediction.

➤ **The writer's name and signature**

It is the last part of the letter where the sender signs off with the first and last name. The signature line may also include the title/post of the sender in formal letters.

➤ **Notations**

Sometimes, letters may contain an optional part consisting of words or abbreviations such as: « R.S.V.P. » which means reply please in French, « Enclosure » which means the letter is accompanied by other documents, « CC » carbon copy which means a copy of the same letter is sent to another person.

1.2. Layout and punctuation

The most common formats of letters are two (2): (i) block form, used mainly in the US (Fig.3), and (ii) indented form, used mainly in the UK (Fig.4). As far as the punctuation is concerned, in British style the salutation is followed by a comma, while in United States style a colon is used instead of the comma. The valediction is followed by a comma. However, in some letters no punctuation is used after the salutation and the closing^[25].

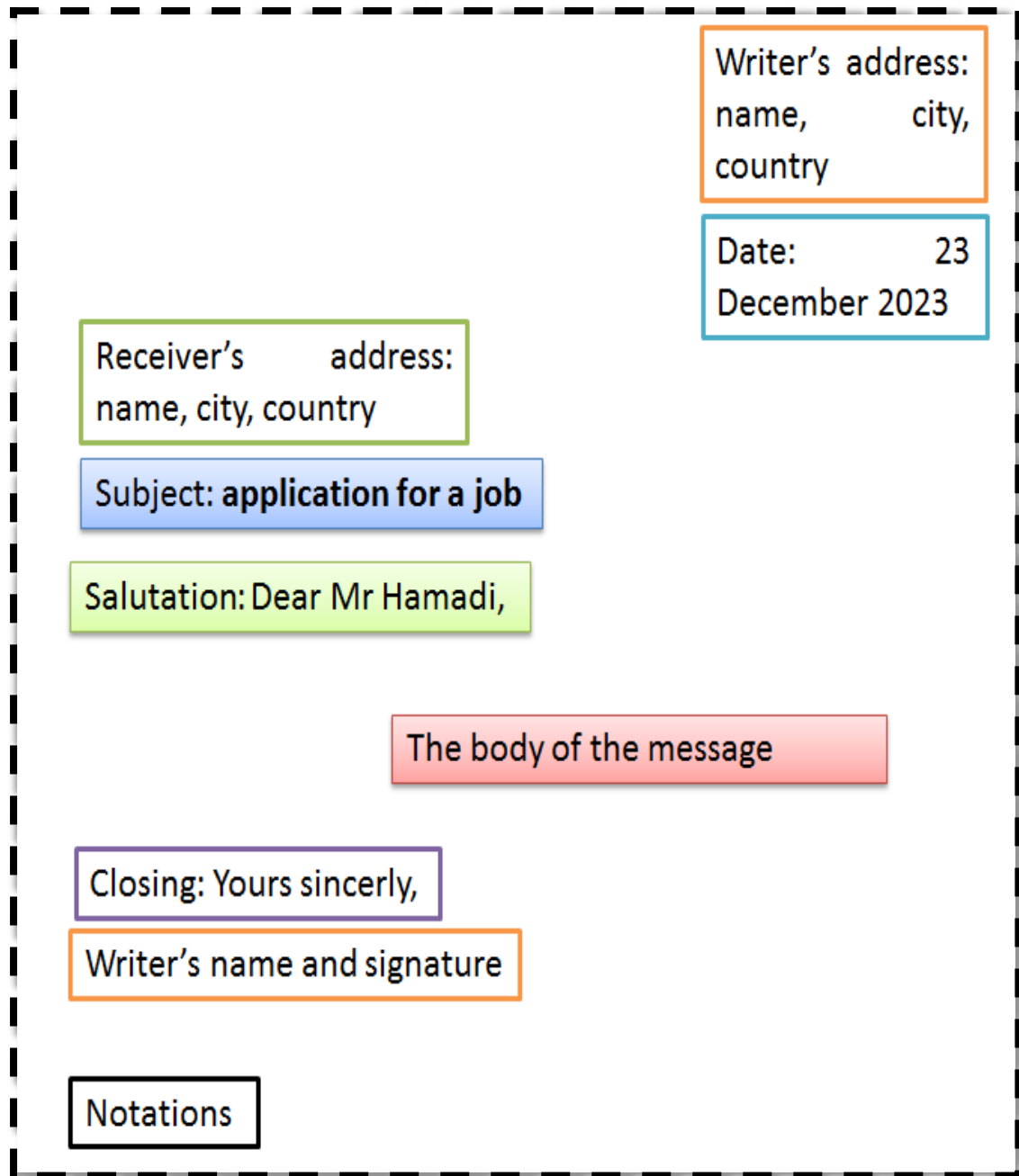


Fig2. Parts of a letter.

The diagram illustrates the structure of a letter in block form. It is enclosed in a large black rectangular border. The components are as follows:

- Writer's address:** An orange-bordered box in the top right corner containing the text "Writer's address: name, city, country".
- Date:** A blue-bordered box directly below the writer's address containing the text "Date: 23 December 2023".
- Receiver's address:** A green-bordered box on the left side containing the text "Receiver's address: name, city, country".
- Subject:** A blue-bordered box below the receiver's address containing the text "Subject: application for a job".
- Salutation:** A green-bordered box below the subject containing the text "Salutation: Dear Mr Hamadi,".
- The body:** A large red-bordered rectangle in the center. Inside, at the top, is a black-bordered box labeled "The body". Below this label are five horizontal dotted lines representing the body text.
- Closing:** A purple-bordered box below the body containing the text "Closing: Yours sincerely,".
- Writer's name and signature:** An orange-bordered box below the closing containing the text "Writer's name and signature".
- Notations:** A black-bordered box at the bottom left containing the text "Notations".

Fig3. Block form.

The diagram illustrates the structure of an indented letter form, enclosed in a large black rectangular border. The components are as follows:

- Writer's address:** An orange-bordered box in the top right corner containing the text "Writer's address: name, city, country".
- Date:** A light blue-bordered box directly below the writer's address containing the text "Date: 23 December 2023".
- Receiver's address:** A light green-bordered box on the left side containing the text "Receiver's address: name, city, country".
- Subject:** A light blue-bordered box below the receiver's address containing the text "Subject: application for a job".
- Salutation:** A light green-bordered box below the subject containing the text "Salutation: Dear Mr Hamadi,".
- The body:** A large red-bordered rectangular area in the center. Inside, the word "The body" is in a black-bordered box at the top. Below it are two paragraphs of text, each starting with "Indention" followed by a dotted line, indicating the start of a new line in the body text.
- Closing:** A purple-bordered box below the body containing the text "Closing: Yours sincerely,".
- Writer's name and signature:** An orange-bordered box below the closing containing the text "Writer's name and signature".
- Notations:** A black-bordered box at the bottom left containing the text "Notations".

Fig4. Indented form.

1.3. Informal letters

We write informal or personal letters to friends and relatives. They can be love letters, invitations, congratulatory letters, apology letters, condolence and sympathies letters...etc. Their tone and style are usually familiar, so we can use idioms and contracted forms like won't, can't, I'll etc. This type of letters contains the following parts^[26]:

- ✓ Senders' address
- ✓ Date
- ✓ Salutation
- ✓ Content required, can be long and detailed
- ✓ Concluding line
- ✓ Complimentary closure
- ✓ Signature line

	8C, Sonia Apartments, Mango colony, M.G. Road, Dharavi, Mumbai - 400 016. 13th February, 2013.
<i>My dear Father,</i>	
I am writing this to assure you that we are all doing well, and that mother is keeping excellent health.	
My little brother's cough had got a little worse; but our doctor who is visiting him daily, assures us that there is no cause for anxiety, and that he will be all right in a few days, certainly before you return.	
So you may come after finishing your business there in Chennai.	
With love,	<i>yours affectionately,</i> A B C

No 2317, Azad Apartments,
J.J Colony,
Dehra Dun-248008

3 February 2016

Dear Harry,

I have not heard from you for some time. We will soon be celebrating Holi at the end of the month on 27 February.

It would be wonderful if you could join us to celebrate this colourful festival. I remember telling you all about it when you were last in India. You had said you would love to be a part of the festivities. Well, nothing like this time! We are going to celebrate it in Mathura, my mum's hometown. Holi is best celebrated here since it is the birthplace of Lord Krishna. The experience will be totally authentic. You must try to bring your sister, Clara, along with you. It will be fun for her as well.

You must try to come. We will make all arrangements for stay and travel in India.

Yours lovingly,
Sara

8C, Heaven colony,
M.G. Road,
Dharavi,
Mumbai - 400017.
13 February- 2013.

Dear Brother,

Thanks for your lovely birthday card. It was very well made. Yesterday, I visited a book exhibition and have picked up a book on "Human Values" for you. After all, character plays a very significant role in one's life.

I was shocked to hear from mother that you were caught copying in your exams. It was shocking and very embarrassing to know this. What's wrong with you? Weren't you prepared for the paper? Even if you hadn't studied, what was the need to cheat? Remember, it is important to be a good human being first. Scoring a few more marks by employing low means is not right. Frankly speaking, I was ashamed as I was the Head boy in class X and the thought that the Principal and the teachers would discuss about my brother cheating in class was a very disturbing thought. Mother told me that she has to meet the Principal along with Father. What an embarrassing moment for them! Our deeds reflect our family background, don't you know that?

Hope you realize your mistake and promise yourself to be honest always. You can improve for the best only if you are determined to do so. Take care. All the Best.

Your loving brother,

XYZ.

1.4. Formal letters

These letters are written to discuss business, apply for services, make requests, complaints, ...etc. They contain the following parts^[26]:

- ✓ Senders' address
- ✓ Date
- ✓ Receivers' address
- ✓ Subject
- ✓ Salutation
- ✓ Content-Specific, to the point
- ✓ Concluding lines
- ✓ Complimentary closure
- ✓ Signature along with designation or title

	Maxell Taylor 930 Lewis Street, Chicago, IL 60609
	September 15, 1988
Data Control International 111 Morris Lane Kankakee, IL 60620	
Dear Ms. Boswell:	
I would like to apply for the position of assistant computer programmer as advertised in the September 14, 1988 Chicago <i>Daily News</i>. I feel that I am especially qualified, and would appreciate your sending me an application form.	
Please send the application to the address above. Thank you for your help.	
	Sincerely yours,
	Maxell Taylor

7G, Rainbow colony,
Sonia Appartment,
Dharavi Cross Road,
Dharavi,
Mumbai - 400017.
13 March 2013

The Advertiser,
Box A - 605,
The Times of India,
Mumbai - 400 001.

Subject : Application for the post of sales representative.

Dear Sir,

With reference to your advertisement for a sales representative in yesterday's issue of 'Times of India'. I wish to apply for the post.

I passed my B.com with a first class from Mumbai University in May 2011. I have just completed a diploma course in Business Management and Sales. I am 23 years old and I have a fine health. I have a good command of English and Marathi is my mother tongue. I can also speak Hindi quite well. I have a good aptitude for salesmanship. I assure you that if I am given the post. I shall give it my very best and shall not give you any chance to reconsider your decision.

Yours faithfully,
XYZ.

Enclosures : (i) CV.
(ii) Photocopy of examination results.
(iii) Certificate from APTECH.

In formal letters, there are some elements that should be avoided, some of them are displayed in table 3.

Table 3. Elements to avoid in formal writing^[26].

	Informal	Formal
Contractions	isn't, weren't	No (replace with "is not, were not")
Abbreviations	FYI, ASAP	No (replace with "for your information, as soon as possible")
Phrasal verbs	put off, ship off	No (replace with "postpone, send")
Emoticons	;-)	No
All capital letters	SOOO GREAT	No
Conjunctions	so, but	No (can substitute "therefore, however")

2. Writing emails

Emails are considered less formal than printed letters. However, they can be made to appear more formal by following the formatting guidelines for printed letters. It is worth noting that in email correspondence, the heading, date, and inside address can be omitted as they are easily accessible in the recipient's inbox. Additionally, since email is generally less formal than a printed letter, it may be acceptable to address the recipient as 'Dear' followed by their first and last name without a title, particularly in the first correspondence when the recipient's title is unknown^[26].

After a prolonged period of email correspondence with the same individual, formality may start to diminish. In such cases, it may be appropriate to introduce a more personal touch by using first names in the

greeting, once one of the signatories has used only the first name in closing. Dropping the family name in the closing implies permission for the other party to switch to a first-name basis if they wish. Whether formal or informal, emails should always include a subject line that clearly informs the reader of the main topic. Use keywords, not sentences, and aim to be as specific as possible^[26].

Tuto 1

Coined by Walter G. Rosen in the year 1986, the term biodiversity refers to diversity or variability of living organisms present on this planet earth and other species which have driven to extinction millions of years ago. Biodiversity is also referred to as the biological diversity which mainly denotes the total number of different living species, living within a particular region including the microbes, plants, animals, and ecosystems such as coral reefs, forests, rainforests, deserts etc. Therefore, in biodiversity, every single living species has an equally important role in the ecosystem.

The diversity of plants is an important resource for food, shelter, and agriculture. About thousands of plant crop species have been identified, developed, used and relied on for the purpose of food and agricultural production in human history. Through the process of photosynthesis, plants provide us with the oxygen which we breathe and the sugars that provide the primary fuel for life. There is a great variation in the biodiversity, resulting from human and ecosystem interaction for certain food and development for the survival of the human population, in addition to the pests, climate fluctuations, diseases, droughts and other unexpected environmental events. Currently, there are only a few crop species which provide us with food and essential energy requirements for the total human population all around the world. These crops include rice, wheat, maize, cereals, pulses, etc. As per the requirement on this moderately small number of crops for global food security, it will be essential to maintain a continuity of these plants species along with the increasing environmental stress and to provide opportunities for the farmers to breed more amount of crops that can be cultivated under

unfavourable conditions such as poor soil, salinity, drought, flooding, and extreme temperatures.

Similarly, the biodiversity of animals is vast and there are several animal species which have been trained, domesticated and used for the food production, for the agriculture and are the primary biological capital for livestock development. This plays a vital role in food safety and also in maintaining rural development. Yet, its management has been terrible. There have been a lot of animals that have gone extinct over the past few years and this is a matter of great sorrow.

- Read the text carefully and answer the questions.

I- Reading comprehension:

- 1-Give a title to the text.
- 2-When the term “biodiversity” was invented? And who is the inventor?
- 3-Suggest three (03) keywords for this text.
- 4-State the crops that give the human beings the essential of their life.
- 5-According to the text, what is the definition of « biodiversity »?
- 6-Cite the different factors that affect the variation in biodiversity.

II- Vocabulary :

1- Find in the text synonyms		2- Give the Arabic or the French equivalents of these terms	
Crutial		Crop	
Necessity		Drought	
To give		Through	
Agricultural		To breathe	
Animal		Purpose	
Invented		fluctuations	

3-Find in the text words that are similar in meaning to the following linking words: hence, furthermore, likewise, nowadays.

III- Grammar: to which part of speech do the underlined words belong.

Noun	Pronoun	Verb	Adverb	Adjective	Conjunction	Preposition

IV- Translate the underlined part of the text into Arabic or French.

Tuto 2

-Read the text carefully and answer the questions.

Research has shown that certain minerals are required by plants for normal growth and development. These are included in the essential elements. The soil is the source of these minerals, which are absorbed by the plant with the soil water. Even nitrogen, which is a gas in its elemental state, is normally absorbed from the soil in the form of nitrate ions (NO_3^-). Some soils are notoriously deficient in micronutrients and are therefore unable to support most plant life. Serpentine soils, for example, are deficient in calcium, and only plants able to tolerate the low levels of this mineral can survive. In modern agriculture, mineral depletion of soils is a major concern, since harvesting crops interrupts the natural recycling of nutrients back to the soil.

Mineral deficiencies can often be detected by specific symptoms such as chlorosis (loss of chlorophyll resulting in yellow or white leaf tissue), necrosis (isolated dead patches), anthocyanin formation (development of deep red pigmentation of leaves or stem), stunted growth, and development of woody tissue in an herbaceous plant. Soils are most commonly deficient in nitrogen and phosphorus. Nitrogen-deficient plants exhibit many of the symptoms just described. Leaves develop chlorosis; stems are short and slender; and anthocyanin discoloration occurs on stems, petioles, and lower leaf surfaces. Phosphorus-deficient plants are often stunted, with leaves turning a characteristic dark green, often with the accumulation of anthocyanin. Typically, older leaves are affected first as the phosphorus is mobilized to young growing tissue. Iron deficiency is characterized by chlorosis between veins in young leaves.

Much of the research on nutrient deficiencies is based on growing plants hydroponically, using soil-less nutrient solutions. This technique allows researchers to create solutions that selectively omit certain nutrients and then observe the resulting effects on the plants.

I/ Reading comprehension (Use the skimming and the scanning strategies)

- 1) What would you suggest as a title for this text ?
- 2) Can the micronutrients-deficient soils tolerate the plants?
- 3) There are five symptoms of mineral deficiencies, cite them briefly?

II/ Vocabulary

1- Find in the text synonyms of these words

Demanded	
Capable	
To show	
To permit	
Sign	

2- Give French or Arabic equivalents to the following terms

research	
nutrient	
absorbed	
effects	
growth	

III/ Paraphrase the underlined parts of the text.

Tuto 3

In our planet, organisms interact with one another in many ways, including competitive, predatory, parasitic, and facilitative ways, such as pollination, seed dispersal, and the provision of habitat. Moreover, there are fundamental linkages among organisms and their physical and biological environment which constitute an interacting and ever-changing system that is known as an ecosystem. Humans are a component of these ecosystems. Indeed, in many regions they are the dominant organism. Whether dominant or not, humans depend on ecosystem properties and on the network of interactions among organisms and within and among ecosystems for sustenance, just like all other species. Ecosystems are broadly divided into natural and artificial. Natural ecosystems are those that are existing in nature; they are further classified into terrestrial and aquatic. Terrestrial includes hot desert, grassland, tropical and temperate rainforest and aquatic includes ponds, river, streams, lakes, estuaries, oceans, mangroves, swamps and bays etc. However, these two ecosystems are self regulating, open system with a free exchange of inputs and outputs with other systems. Artificial ecosystems are simple, human-made, unstable and subjected to human intervention and manipulation. Usually it is formed by clearing a part of the forest or grassland e.g. crop field, agricultural land. Ecosystem function is the capacity of natural processes and components to provide goods and services that satisfy human needs, either directly or indirectly. Ecosystem functions are subset of ecological processes and ecosystem structures. Each function is the result of the natural processes of the total ecological sub-system of which it is a part. Natural processes, in turn, are the result of complex interactions between biotic and abiotic components of ecosystems through the universal driving forces of matter and energy.

There are four primary groups of ecosystem functions (1) regulatory functions, (2) habitat functions, (3) production functions and (4) information functions.

-Read the text carefully and answer the questions.

I- Reading comprehension :

1-Suggest a title for the text.

2-Divide the text into paragraphs, then provide the main idea of each.

3-Chose the right sentences below:

-We define ecosystem as : a-The living organisms of a habitat and their surrounding environment function together. b-The interaction of all species and the soil peculiarities. c-The linkage among living beings and all environmental drivers.	-Ecosystems are divided into : a-Aquatic and terrestrial. b-Natural and artificial. c- Clayey and sandy.
-The natural ecosystems are : a-Independent systems. b-Isolated system from the other systems. c-Human-made and very stable.	-Ecosystem function is : a-The faculty of natural processes and components to respond to human being requirements. b-The result of several relationships between biotic components. c-The subset of ecosystem structures and ecological factors.

II- Vocabulary :

1- Find in the text synonyms	2- Give the arabic or the french equivalents of these terms
Connection	To provide
Basic	Rainforest
To please	Regulatory

Ability		Grassland	
Element		Needs	
Outcome		Outputs	

III- Grammar:

1-To which part of speech do the underlined words belong ?

Noun	Pronoun	Verb	Adverb	Adjective	Conjunction	Preposition

2- Find in the text words that are similar in meaning to the following and tell what do they express: in fact, nevertheless.

IV- Written expression:

1-Write a paragraph about the importance of ecology.

2-Paraphrase the following passage: « In our planet, organisms interact with one another in many ways, including competitive, predatory, parasitic, and facilitative ways, such as pollination, seed dispersal, and the provision of habitat. Moreover, there are fundamental linkages among organisms and their physical and biological environment which constitute an interacting and ever-changing system that is known as an ecosystem ».

Tuto 4

Ecology is basically a branch of biology. It deals with study of interactions among organisms (protozoa, bacteria, fungi, plants, animals...) and their biophysical environment. This biophysical environment includes both biotic and abiotic components. **(The word "ecology" was invented in 1866 by the German scientist Ernst Haeckel).** The word comes from the Greek *oikos*, meaning “household,” “home,” or “place to live. The **Biophysical environment** in which all interactive mechanisms happen is called as an ecosystem. Since the ecosystem is a geographic area where plants, animals, and other organisms, as well as weather and landscapes, work together to form a bubble of life, earth science becomes the backbone of ecology. Ecology deals with organisms, populations, communities, ecosystems and the biosphere. The place of living is the organism's environment. Therefore, ecology is sometimes, called as environmental biology. Hence, ecology is recognized as one of the natural sciences. It is considered to be a science concerned with the nature and the interrelations of biocenosis.

One of the first ecologists may have been Aristotle or perhaps his student, Theophrastus, both of whom had interest in many species of animals. **(Theophrastus described interrelationships between animals and their environment as early as the 4th century BC).** Ecological thoughts are mostly derived from established concepts of philosophy, ethics, politics and natural history. Ancient Greek philosophers such as Hippocrates and Aristotle laid the foundations of ecology in their studies on natural history.

Modern ecology became a much more rigorous science in the late 19th century. Evolutionary concepts relating to adaptation and natural selection became the lead areas of study. In its early stages, the field was dominated by scientists trained as botanists and zoologists.

I. Reading Comprehension (Use the skimming and the scanning strategies)

1. Give an appropriate title to the text.
2. What is the difference between classic ecology and modern ecology?
3. What are the main types of the research field in ecology?

II- Vocabulary

1. What is the synonym of the underlined parts in the text?
2. Cite two linking words from the text.
3. Give the singular of these terms: protozoa , bacteria, fungi, biocenoses, and ecologists.
4. Correct these sentences:

a- In ecology, animals and plants are independent of the surrounding environment.

b- Ecosystems are in temporary evolution.

5. Complete the following sentence using the appropriate terms in the text.

An ecosystem consists of and components.

III-Grammar

1. Provide a simple and a compound sentence form the text.
2. Transform the sentences between brackets (...) in the text into active or passive voice.
3. Complete the table by giving the adjective, the noun and the verb:

adjective	noun	verb
.....		move
.....	Strength	
heavy		

IV-Written expression

Translate this passage into English:

Les carabidés représentent un groupe taxonomique très utilisé comme bioindicateurs de l'état de santé des écosystèmes. Toutefois, les facteurs clés expliquant leur diversité dans les zones humides salées sont peu révélés. La présente étude a pour but de fournir, d'un côté, des données sur les différents niveaux de diversité, la structure et les traits fonctionnels de la communauté carabique, inféodée aux zones humides de l'étage bioclimatique semi-aride de l'Est Algérien et, d'un autre côté, identifier les facteurs environnants (sol, climat et recouvrement végétal) responsables du pattern de distribution.

Tuto 5

Plants are a vital part of the world's biological diversity and **have** great economic and cultural importance. Plant biodiversity balances ecosystems, protects watersheds, and mitigates erosion. **It** also affects climate, and provides shelter for many animal species. This study aimed to determine plant diversity in relation to the soil properties of semi-arid rangelands along a gradient at the watershed scale in the Oued Chabro, Algeria. Plants and soil were sampled at 27 points distributed in three sampling sites (upstream, midstream, and downstream). The floristic data was analyzed using species richness estimators, life forms, spatial occurrence, and multiple factor analysis. Moreover, the effects of soil properties on the taxonomic structure of plant communities in the sampling sites were analyzed using Pearson correlations. The characterized flora included 42 plant species classified into 18 families, and *Asteraceae* (38.1%), *Poaceae* (14.3%), *Brassicaceae* (7.1%), *Amaranthaceae* (4.8%), and *Chenopodiaceae* (4.8%) were the most representative in terms of species. The species *Atractylis delicatula* was dominant (relative abundance = 81.5%). The upstream site was characterized by a high vegetation cover, high species abundances, and richness in plant families and genera. Significant correlations were observed in this area between the number of genera, number of families, number of species, family richness, Pielou evenness index, and Simpson's concentration index. The upstream site was characterized by *chamaephytes* and *phanerophytes*; 16 species were exclusively present in this section. Two species were found in the midstream site and one (*Scolymus hispanicus*) was found in downstream site. The upstream site was positively correlated with plant litter, the midstream with barren soil, and the downstream study area was negatively correlated with coarse-grained materials and vegetation cover.

This work demonstrated that differences in life forms, fertility, and variety exist among the three sampling sites due to the soil differences and the positions along the watershed.

Part I

- 1- Give a title to the text.
- 2- Suggest 04 key words related to the aim of this study.
- 3- Divide the text into paragraphs, then write the main idea of each.
- 4- What is the objective of this study?
- 5- What is the most dominant species?

Part II

- 1- What do the underlined words in the text refer to?
- 2- Find words in the text which correspond to these definitions:
 - a-: Represents the net community-level or regional aggregate of many individual species extinctions and immigrations once equilibrium is reached.
 - b-: is a geographic area where plants, animals, and other organisms, as well as weather and landscapes, work together to form a bubble of life.
 - c-: It's a land area that channels rainfall and snowmelt to creeks, streams, and rivers, and eventually to outflow points such as reservoirs, bays, and the ocean.
 - d-: is the wearing away of sand, soil, or rock by water or wind.
- 3- Find synonyms for the following words in the text: biodiversity, Oued, fertility, variety.

Part III

1- Provide a brief summary of the text (no more than 35-40 words).

2- Translate the following paragraph into French:

Plants are a vital part of the world's biological diversity and have great economic and cultural importance. Plant biodiversity balances ecosystems, protects watersheds, and mitigates erosion. It also affects climate, and provides shelter for many animal species.

Tuto 6

Insects, particularly bees, are the primary pollinators of most agricultural crops and wild plants (Potts et al. 2010). The super order Apoidea is characterized by a great morphological diversity as well as an important behavioral diversity. Furthermore, their ecological traits such as: lectism, degrees of sociability, nesting strategies, and activity periods are combined within bee communities to exploit floral resources in the same ecosystem in different modalities such as time and space (Gibson et al. 2006). Bees are major contributors to entomophilic pollination necessary for the survival of many natural and cultivated plants (Roubik 1995; Danforth et al. 2006; Ollerton et al. 2011), they play a substantial role in nature, but are also of great importance for the human economy (Banasza-Cibicka 2021). In fact, in many cases, wild bees are even better pollination vectors than honey bees and have the potential to improve crop yields (Garibaldi et al. 2017; Klein et al. 2018; Wagner 2020; Leclercq et al. 2023). In Algeria, several studies on wild bees have been carried out during the last two centuries by Lepeletier (1841), Lucas (1849), Dours (1872, 1873), Pérez (1895, 1902, 1903), Saunders (1908), Alfken (1914), Morice (1916), Schulthess (1924) and Warncke (1974), but their data are still fragmentary and incomplete. More recently, more extensive studies have been conducted in Northeastern Algeria on

Andrenidae, Halictidae, Apidae, Megachilidae and even cleptoparasitic species by Scheuchl et al. (2011); Benarfa et al. (2013), Aguib et al. (2014), Djouama et al. (2016), Maghni et al. (2017), Bakiri et al. (2017), Chichoune et al. (2018). According to Rasmont (1995), the Maghreb and North Africa probably represent an apoidal diversity comparable or even superior to that of California where 1200 species have been counted (Moldenke and Neff 1974). Hence, a total of 860 species belonging to the Andrenidae (191), Apidae (228), Colletidae (55), Halictidae (122), Megachilidae (253) and Melittidae (11) have been reported (Ascher and Pickering, 2023) but the list is far from being closed. After the description of *Andrena tebessana* (Scheuchl et al. 2011), a new species for science *Anthidiellum africanum* was described by Kasperek et al. (2023) from our material in the region of Tebessa. This finding denotes, once again, that the North African and the Algerian bee fauna are very rich and diversified and need more surveys. Given the important diversity encountered in this Algerian region, the current study was undertaken in order to enrich the incomplete dataset available on wild bee community. It intends, on the one hand, to contribute to the elaboration of a taxonomic list of wild bees in two stations of the Algerian Northeast and, on the other hand, to study the relationship between these insects and the visited plants according to the flowers foraged. Our results provide important data on the ecology of this fauna in Algeria that can be used in

future studies for the conservation of the habitat of the populations of these species.

Exercise 1

- 1- Propose a suitable title for the text.
- 2-Suggest four keywords that reflect the purpose of the study.
- 3-Separate the text into paragraphs and identify the central idea of each paragraph.
- 4-What is the main aim of this research?
- 5-Which species is reported as the most dominant?

Exercise 2

- 1-Write a short summary of the text in 35–40 words maximum.
- 2-Translate this passage into Arabic:

“Insects, particularly bees, are the primary pollinators of most agricultural crops and wild plants. The super order Apoidea is characterized by a great morphological diversity as well as an important behavioral diversity. Furthermore, their ecological traits such as: lectism, degrees of sociability, nesting strategies, and activity periods are combined within bee communities to exploit floral resources in the same ecosystem in different modalities such as time and space.”

Exercise 3

1. Define the role of bees in natural and agricultural ecosystems.
2. Explain why wild bees are considered important pollinators.
3. List the ecological traits mentioned in the text that characterize bee communities.
4. Identify the bee families reported in Algeria.
5. Why do scientists believe that North Africa has a very rich bee diversity?
6. Name the recently described bee species mentioned in the text.
7. Explain the relationship between bees and flowering plants.
8. Find two arguments from the text showing the economic importance of bees.
9. According to the text, why are additional surveys on Algerian bees necessary?
10. Give a synonym from the text for:
 - “variety”
 - “essential”
 - “significant”
11. Find words in the text related to ecology and biodiversity.
12. Identify the scientific names written in italics style in the text.
13. Write True or False:
 - Honey bees are always better pollinators than wild bees.
 - Algeria has a completely studied bee fauna.
 - Bees contribute to crop production.
 - New bee species are still being discovered in Algeria.

-
14. Answer the following question in your own words:
“Why is bee conservation important?”
15. Write a short paragraph about the importance of pollinators in biodiversity conservation.

Tuto 7

Aquatic ecosystems are considered as essential water sources for most human needs and activities (Meybeck 2006; Menbohan et al. 2011). They provide many benefits such as access to drinking water necessary for the life of all the living creatures and for agricultural and industrial purposes (Wilson and Carpenter 1999; Zhao et al. 2017; Mezgebu et al. 2019; Salmaso et al. 2021). In addition, they constitute living environments for plants and refuges for aquatic biota vertebrates and invertebrates. These freshwater ecosystems are under threat all over the world, due to anthropogenic activities (Clausnitzer et al. 2012).

In order to understand the environmental status of rivers and streams, water quality assessment represents one of the most important topics (Skoulikidis et al. 2011; Begum et al. 2022). In Algeria, recent studies showed the degradation of water quality in wadis due to discharges of domestic and industrial wastewater and the excessive use of fertilizers and pesticides in agriculture (Yoshida et al. 2005; Gasmi et al. 2006; Chaoui et al. 2012; Bengherbia et al. 2014). In the Seybouse catchment area, the pollution of surface waters has been widely documented (Chaoui et al. 2013; Regam et al. 2015; Belabed et al. 2019) in particular at the Lower Seybouse which represents a major industrial zone in Africa (Belabed et al. 2017). This pollution has led to the decline of freshwater biodiversity (Feio et al. 2021; Romero et al. 2021) exacerbated by other factors such as habitat fragmentation and climate change which induce a decrease in rainfall especially in North Africa .

All of these researches were based on the measurement of pollution parameters and contaminants such as heavy metals. However, these assessments are not relevant enough and give little information on the

direct or indirect effects and the disturbance they can cause on aquatic fauna. Complementary biological methods based on Macroinvertebrates or other faunistic groups began in Europe more than a century ago (De Pauw' and Vanhooren 1983) and are actually, increasingly used to study the ecological integrity of aquatic ecosystems (Szczerbińska and Gaczyńska 2015).

Macroinvertebrates contain a large group of insects that spend a long part of their life cycle in wadis under larval form; therefore, they are exposed to physico-chemical variations of water and integrate effects of altered environmental quality over a period. The community structure is altered, so, mortality, reduced growth are reflected on the biotic potential (Cairns and Pratt 1993; Woodcock and Huryn 2007; Hellawell 2012; Saoudi et al. 2018; Eriksen et al. 2021). Because most of them are highly sensitive to anthropogenic alterations (Stoneflies, Mayflies and Caddisflies) while others are tolerant to pollution (Chironomidae, Gammaridae, Elmidae) they can therefore be a bioindicators and serve as a tool in biomonitoring programm worldwide (Beisel et al. 2000; Davis et al. 2010; Uherek and Gouveia 2014; Anyanu et al. 2019; Strungaru et al. 2021; Yorulmaz and Ertaş 2021; Vilenica et al. 2022). They also exhibit a high heterogeneity in habitat (Shimba and Jonah 2016; Arenas-Sánchez et al. 2021) and several species from aquatic groups can persist for years in dry river sediments as cysts, cocoons, or diapausing juveniles or adults (Datry et al. 2017). Furthermore, as predators and prey, these organisms play an important role in the trophic chain of aquatic habitats (Dallas and Mosepele 2007; Vilenica et al. 2022). They are easy to sample (Chessman 1995) and identification keys exist for all groups.

In other countries as well as Algeria, researches on aquatic fauna were devoted, from one hand, to taxonomy, biogeography, and ecology of

Macroinvertebrates (Arab et al., 2004; Lounaci et al. 2000a; Lounaci et al. 2000b), from another hand, to test the physico-chemical and biological approaches, such as IBGN (Bekhouche et al. 2017), EPT (Nikolaos et al. 2011; Sabha et al. 2022; Huh and Lee, 2023). BMWP (Duran and Suicmez 2005 ; Uherek and Gouveia 2014) and EPT (Saal et al. 2020), LBI (Vernneaux et al. 2004), PTI (Chirwa and Chilima 2017). Another approach, based on the functional trait composition of macroinvertebrate communities, was used to explain how physical and chemical parameters and land use could influence the trait composition of benthic Macroinvertebrates (Benzina et al. 2021). The aim of this paper is to understand the composition and the structure of Macroinvertebrate communities and to assess their responses to the measured environmental factors.

I. Comprehension Questions

1. Why are aquatic ecosystems considered important for humans?
2. What are the main causes of freshwater ecosystem degradation mentioned in the text?
3. Why is water quality assessment important?
4. What are the limits of physico-chemical pollution assessments according to the text?
5. Why are macroinvertebrates useful in biomonitoring programs?
6. Name three groups of pollution-sensitive macroinvertebrates cited in the text.
7. Which macroinvertebrate groups are considered tolerant to pollution?
8. Explain the ecological role of macroinvertebrates in aquatic ecosystems.
9. Why are macroinvertebrates easy to use in environmental studies?

10. What is the main objective of this study?

II. Vocabulary Exercises

A. Find synonyms from the text for the following words:

1. danger → _____
2. contamination → _____
3. decrease → _____
4. important → _____
5. environment → _____

B. Match the words with their meanings:

Word	Meaning
------	---------

Habitat	a. Study of living organisms
---------	------------------------------

Biodiversity	b. Variety of living organisms
--------------	--------------------------------

Ecology	c. Natural living place of organisms
---------	--------------------------------------

Pollution	d. Contamination of the environment
-----------	-------------------------------------

III. True or False

Write **True (T)** or **False (F)**.

1. Aquatic ecosystems are only useful for industrial activities.
2. Human activities threaten freshwater ecosystems worldwide.
3. Macroinvertebrates can indicate water quality.
4. All macroinvertebrates are resistant to pollution.
5. Climate change contributes to freshwater biodiversity decline.
6. The study focuses only on heavy metal pollution.

IV. Paragraph Analysis

Divide the text into paragraphs and write the main idea of each:

Paragraph	Main Idea
Paragraph 1	
Paragraph 2	
Paragraph 3	
Paragraph 4	
Paragraph 5	

V. Short Writing Tasks

1. Write a short summary of the text in 40–50 words.
2. Explain in a short paragraph the importance of protecting freshwater ecosystems.
3. Write a paragraph about the role of macroinvertebrates as bioindicators.

VI. Scientific Analysis

1. Give a suitable title to the text.
2. Suggest four keywords related to the study.
3. Identify the environmental problems affecting Algerian wadis.
4. Mention the biological indices cited in the text.
5. What approach was used to study the influence of environmental factors on macroinvertebrates?

VII. Multiple Choice Questions (MCQ)

1. Macroinvertebrates are mainly used to:
 - a) Produce oxygen
 - b) Measure biodiversity directly
 - c) Assess water quality
 - d) Increase rainfall
2. One major threat to freshwater ecosystems is:
 - a) Reforestation
 - b) Anthropogenic activities
 - c) Natural selection
 - d) Pollination
3. The acronym EPT refers to groups of:
 - a) Fish
 - b) Mammals
 - c) Pollution-sensitive insects
 - d) Aquatic plants
4. The aim of the paper is to study:
 - a) Agricultural production
 - b) Bird migration
 - c) Macroinvertebrate communities and environmental factors
 - d) Desert ecosystems

VIII. Discussion Questions

1. Why is biomonitoring considered more informative than only measuring chemical pollutants?
2. How can climate change affect aquatic biodiversity in North Africa?
3. Why should freshwater ecosystems be conserved?

Tuto 8

Haut du formulaire

Spiders are known as one of the most diverse (with more than 25,000 species) and functionally interesting predators that regulate the populations of arthropods on land. Since they are omnipotent, numerous and dominant species, they have immense potential in the natural ecosystem generally (Saha et al. 2017; World Spider Catalog 2024), and they hold a great potential for bio-diagnostic purposes in wetland biodiversity assessment specifically (Cristofoli et al. 2010). Moreover, several studies have shown that they are good bioindicators (Ghione et al. 2013; Kaltsas et al. 2014; Ossamy et al 2016), and play a vital role in the well-being of both the planet and humanity by providing a variety of ecosystem services (Correia and Mammola 2024). It is obvious that spiders are important predators in wetlands where they play a crucial role (Denno et al., 2002). Although critical ecosystem services are already recognized for many groups of arthropods, the literature on the services provided by spiders remains largely overlooked (Cardoso et al. 2024). A better understanding of the role of spiders, as a crucial group of arthropods for the proper functioning of ecosystems, could play a key role in solving many problems related to ecological dysfunctions. By promoting better management of this group of arthropods, it would be possible to enhance ecosystem resilience, contributing to the mitigation of climate change impacts, while supporting long-term sustainable solutions to preserve biodiversity.

All of all, wetlands cover about 6% of the Earth's land surface and are among the richest and most diverse ecosystems on the planet, hosting a wide variety of animal and plant species (Mitsch and Gosselink 2015). Algeria is home to a total of 2,375 wetlands, including a significant

number of saline water bodies, primarily situated in the semi-arid regions of the country (Hammana et al. 2024). For this reason, Algeria has worked to protect the environment in general and wetlands in particular. Indeed, it ratified the Convention on Wetlands of International Importance Especially as Refuges for Wild Birds on February 2, 1971 in Ramzar (Iran), and implemented it in national legislation by Decree No. 82-439 of December 11, 1982. In addition, Algeria has imposed strict restrictions on construction in wetland areas, which prohibited without a building permit issued by the competent administrative bodies, especially after the promulgation of Law 11-02 on protected areas within the framework of sustainable development. For example, among the structures that have been built is the salt production factory in Sebkhet Ezzemoul, and before its construction, the law requires the completion of an environmental impact study in the medium and long term (Badri and Hamadene 2025).

The spiders' communities were the subject of many studies in Algeria. Indeed, based on the ecosystem type, the following studies can be stated: Alioua et al. (2012) provided data about the spiders of palm grove ecosystems, Bouseksou et al. (2015), and Mahdi et al. (2024) studied the ecology of spiders in several agroecosystems, Touchi et al. (2018) sampled this taxonomic group in a forest (Zéralda game reserve), Alioua et al. (2016) and Bourbia and Bouslama (2018) worked in a RAMSAR wetland, Saadi et al. (2024) established an inventory of Linyphiidae in a national Park (Theniet El Had), Berretima et al. (2025) provided a checklist of the Algerian spiders' fauna. In general, the terrestrial arthropod fauna of wetlands has received less attention from scientists compared to other ecological components. Nevertheless, these organisms play a crucial role and are among the most impactful in the

ecological functioning of these ecosystems (Batzer and Wu 2020). In the present paper, two (2) RAMSAR wetlands were sampled: Chott Tinsilt and Sebkhet Ezzemoul. These later are facing significant degradation (Amri et al. 2019; Amri and Ouchtati 2023) due to environmental changes and human activities such as overgrazing, salt extraction, and agricultural practices, including water pumping for irrigation. Unfortunately, no study about spider fauna has been conducted in these saline lakes. To address this gap, we have chosen to focus on this taxonomic group as a beneficial group. Hence, the objectives can be summarized as following: (i) compiling the first inventory of spider species in the Chott Tinslit and Sebkhet Ezzemoul, a task that is being conducted for the first time at these sites, (ii) analyzing the spider assemblages and explore their potential as bioindicators of wetland health, (iii) Defining relationships between the biodiversity of spiders and some local environmental drivers.

Part A - General Understanding

1. Choose the correct title

- a) Agricultural Development in Algeria
- b) The Ecological Importance of Spiders in Algerian Wetlands
- c) Climate Change and Forest Ecosystems
- d) Salt Production in Algeria

2. Identify the type of ecosystem mainly discussed in the text.

3. Complete the following sentence:

Spiders are considered important because they regulate
..... populations and can serve as

.....of ecosystem
health.....

Part B - Vocabulary and Terminology

4. Match the scientific term with its meaning

Term	Meaning
Bioindicator	a. Variety of living organisms
Biodiversity	b. Natural services provided by ecosystems
Ecosystem services	c. Organism used to evaluate environmental quality
Wetland	d. Land saturated with water

5. Find words in the text related to:

- Conservation: _____
- Pollution/Human pressure: _____
- Ecology: _____
- Legislation: _____

6. Give synonyms from the text for:

- diverse → _____
- essential → _____
- damage → _____
- study → _____

Part C - Reading Comprehension

7. Why are spiders considered useful in biodiversity assessment?

8. Mention two ecosystem services provided by spiders.

1.

2.

9. What percentage of the Earth's land surface is covered by wetlands?

10. Cite two human activities threatening the studied wetlands.

1.

2.

11. Why were Chott Tinsilt and Sebket Ezzemoul selected for this study?

Part D - Scientific Analysis

12. Fill in the table below

Topic	Information from the text
Study area	
Organism studied	
Main environmental threats	
Importance of the study	

13. What are the three main objectives of the research?

1. _____
 2. _____
 3. _____
-

14. According to the text, why are spiders good bioindicators?

Part E - True or False

Write True (T) or False (F).

1. Spiders are herbivorous organisms. _____
2. Wetlands are among the richest ecosystems on Earth. _____
3. Algeria has no laws protecting wetlands. _____

-
-
4. Spider fauna in the studied saline lakes had already been extensively studied. _____
 5. Human activities contribute to wetland degradation. _____
 6. Spiders can help scientists assess ecosystem health. _____

Part F — Critical Thinking

15. Explain why protecting wetlands is important for biodiversity conservation.

16. In your opinion, how can spiders contribute to ecological balance?

Part G — Writing Activities

17. Write a summary of the text in 50 words maximum.

18. Write a short paragraph about the ecological importance of spiders.

Tuto 9

Cancer is one of the leading causes of death worldwide and represents a major public health challenge. It is a group of diseases characterized by the uncontrolled growth and spread of abnormal cells in the body. Normally, cells grow, divide, and die in an organized manner. However, when this regulation fails, cells can multiply rapidly and form tumors. Some cancers remain localized, while others can spread to distant organs through a process called metastasis.

Several factors can increase the risk of developing cancer. These include genetic predisposition, smoking, unhealthy diet, lack of physical activity, excessive exposure to ultraviolet radiation, environmental pollution, and infections caused by viruses such as the human papillomavirus (HPV) or hepatitis viruses. Although some cancers are hereditary, many are linked to lifestyle and environmental conditions.

Scientific advances in medicine have improved cancer diagnosis and treatment over recent decades. Common treatments include surgery, chemotherapy, radiotherapy, immunotherapy, and targeted therapy. Early detection plays a crucial role in increasing survival rates because many cancers can be treated more effectively at an early stage. Screening programs such as mammography and colonoscopy help detect certain cancers before symptoms appear.

In addition to physical effects, cancer also has psychological, social, and economic consequences for patients and their families. Research in oncology continues to develop new therapeutic approaches aimed at improving patients' quality of life and reducing mortality. Prevention

strategies, awareness campaigns, and healthy lifestyles remain essential tools in the global fight against cancer.

I. General Comprehension

1. Give a suitable title to the text.

2. What is cancer?

3. What is metastasis?

4. Why is early detection important?

II. Vocabulary Exercises

5. Find synonyms from the text for:

- disease → _____
- growth → _____
- important → _____
- prevention → _____

6. Match the terms with their meanings

Term	Meaning
Tumor	a. Spread of cancer cells
Chemotherapy	b. Abnormal mass of cells
Metastasis	c. Drug treatment against cancer
Screening	d. Early medical detection

III. True or False

Write **True (T)** or **False (F)**.

1. Cancer is caused by the controlled growth of cells. _____
2. Smoking can increase cancer risk. _____
3. All cancers are hereditary. _____
4. Early diagnosis improves treatment success. _____
5. Cancer only has physical effects on patients. _____

IV. Paragraph Analysis

Paragraph	Main Idea
Paragraph 1	
Paragraph 2	
Paragraph 3	
Paragraph 4	

V. Scientific Questions

7. Mention four cancer risk factors cited in the text.

1. _____
2. _____
3. _____
4. _____

8. Name three cancer treatments mentioned in the text.

1. _____
2. _____
3. _____

9. What role do screening programs play?

VI. Writing Tasks

10. Write a short summary of the text in 40–50 words.

11. Write a short paragraph about how healthy lifestyles can help prevent cancer.

VII. Discussion Questions

12. Why is cancer considered a global health problem?

13. How can awareness campaigns help reduce cancer cases?

Tuto 10

Bacteria are microscopic single-celled organisms that exist in almost every environment on Earth. They can be found in soil, water, air, food, and even inside the bodies of humans, animals, and plants. Although many people associate bacteria with diseases, most bacterial species are harmless or even beneficial. They play an essential role in ecosystems by decomposing organic matter and recycling nutrients.

Bacteria are classified into different groups according to their shape, structure, and mode of nutrition. Some bacteria are spherical, others are rod-shaped or spiral-shaped. They reproduce rapidly through a process called binary fission, in which one bacterial cell divides into two identical cells. Under favorable conditions, bacterial populations can grow very quickly.

Beneficial bacteria contribute to many natural and industrial processes. In the human digestive system, certain bacteria help digest food and produce vitamins. In agriculture, bacteria improve soil fertility by fixing nitrogen. They are also widely used in food production, such as in yogurt and cheese manufacturing, and in biotechnology for the production of medicines and enzymes.

However, some bacteria are pathogenic and can cause diseases such as tuberculosis, cholera, and food poisoning. Harmful bacteria may spread through contaminated food, water, air, or direct contact. To fight bacterial infections, antibiotics are commonly used. Nevertheless, the excessive use of antibiotics has led to antibiotic resistance, which has become a serious global health concern.

Scientific research on bacteria continues to expand because these microorganisms have important medical, environmental, and industrial applications. Understanding bacterial diversity and behavior is essential for improving human health, protecting ecosystems, and developing new technologies.

I. General Comprehension

1. Give a suitable title to the text.

2. Where can bacteria be found?

3. How do bacteria reproduce?

4. Why are some bacteria considered beneficial?

II. Vocabulary Exercises

5. Find synonyms from the text for:

- tiny → _____
- dangerous → _____
- increase → _____
- important → _____

6. Match the terms with their meanings

Term	Meaning
Pathogenic	a. Process of cell division
Antibiotic	b. Causing disease
Binary fission	c. Substance used to kill bacteria
Nutrients	d. Substances necessary for growth

III. True or False

Write **True (T)** or **False (F)**.

1. All bacteria are harmful. _____
2. Bacteria can live inside the human body. _____
3. Binary fission produces four cells. _____
4. Some bacteria are useful in food production. _____
5. Antibiotic resistance is a global health problem. _____

IV. Paragraph Analysis

Paragraph	Main Idea
Paragraph 1	
Paragraph 2	
Paragraph 3	
Paragraph 4	

Paragraph	Main Idea
Paragraph 5	

V. Scientific Questions

7. Mention three beneficial roles of bacteria.

1. _____
2. _____
3. _____

8. Cite two bacterial diseases mentioned in the text.

1. _____
2. _____

9. What is antibiotic resistance?

VI. Writing Tasks

10. Write a short summary of the text in 40–50 words.

11. Write a short paragraph about the importance of bacteria in nature.

VII. Discussion Questions

12. Why should antibiotics be used carefully?

13. How do bacteria contribute to ecosystem balance?

Tuto 11

The text below is the material and methods part of an article.

Study area

The two (2) studied salt wetlands: Chott Tinsilt and Sebkhet Ezzemoul, are located in the Wilaya of Oum El Bouaghi, in Eastern Algeria (Fig. 1). They are part of the Constantinois High Plateaux wetlands eco-complex, and have been classified as Ramsar sites, in 2004 for Tinsilt and in 2009 for Ezzemoul (Amri 2020). At each site, two localities were selected: Plot1 and Plot2 in Chott Tinsilt and Plot3 and Plot4 in Sebkhet Ezzemoul. The choice of these localities was based on several criteria: (i) vegetation cover (presence or absence and dominant vegetation type), (ii) distance from the site, (iii) no studies have been carried out on spiders at these wetlands, and (iv) accessibility and safety. A description of sampling localities is displayed in table1.

We obtained climatic data from the records of the nearest weather station which is Batna meteorological station, located 15 km from both wetlands. This data encompassed the period from 1973 to 2018. The calculation of several climatic indices allowed to characterise the climate of the study area: (i) Emberger quotient modified by Stewart (1968) $Q2 = 3.43P / (T_{max} - T_{min})$, (ii) aridity index or De Martonne index $I = P / (T_m + 10)$ (Lungu et al. 2011), (iii) continentality index or Debrach index (CI) which calculates the difference between the mean daily maximum temperature of the warmest month (T_{max}) and the mean daily minimum temperature of the coldest month (T_{min}) (Debrach 1953). Where: P = total annual precipitation and T_m = mean annual temperature. The values and signification of these indices are displayed in table2.

In addition, the Gaussen and Bagnouls diagram for the climatic period (1973-2018) shows that the dry season extends from mid-April to the end of November, while the dry season for the year of study (2017-2018) is longer and extends from mid-February to the end of October (Fig.2). Overall, the precipitations are not regular (annual total = 238.20 mm) with very important seasonal variations. Indeed, April represent the rainiest month (27.58 m), whereas July is the driest month (6.61 mm). The minimum temperatures are recorded in January (0.54 °C), while the maximums are recorded in July (34.80 °C).

In both salt wetlands, the vegetation is mainly based on halophytes. In fact, the Chott Tinsilt is dominated by the species *Atriplex halimus* (L.) in Plot1, and *Salsola vermiculata* (L.) and *Salicornia arabica* (L.) in Plot2. The Sebkhet Ezzemoul is dominated by *Salicornia* sp., *Juncus maritimus* (Lam.) and *Salicornia arabica* (L.) in Plot3, and *Sueda fruticosa* (Forssk.) in Plot4.

Sampling procedure and identification

In each plot, 12 points of sampling were identified. These points are equidistant of at least 20 m. In each sampling point we installed two (2) plastic cups (diameter: 10 cm, depth: 11 cm). These traps were filled with 300 ml of water with salt, drops of vinegar and detergent. Sampling was carried out systematically and fortnightly during seven (7) months, from November 2017 to May 2018. The collected individuals were rinsed with water, stored in vials with alcohol (70%), and identified using the following keys: Jocqué and Dippenaar-Schoeman (2007), Roberts (2009).

Measurement methods of soil and vegetation

Within each locality, soil samples are taken three (3) times during the study period: November, January and March. In each sampling point and at a depth of 15 cm, a quantity of soil (1.5 kg) is taken and transported to the laboratory. All parameters are carried out on sieved soil (2 mm): (i) soil moisture (Mathieu and Pieltain 2003), (ii) the pH and the electrical conductivity are estimated by pH and conductivity meter by mixing soil and water (1/5), (iii) the soil organic matter (Bonneau and Souchier 1994), (iv) the soil texture. Furthermore, the cover vegetation rate was also measured by applying the linear method (Canfield 1941).

Data analysis

Alpha diversity analysis

The relative abundance (RA %) was calculated for each species, it is the ratio of the number of individuals of a species to the total number of individuals. The dominance, subordinate, transient (DST) classification is used to classify species according to their abundances (Mariotte 2014). Three (3) categories of species were distinguished: (i) transients species (Tr) with RA% <2%, (ii) subordinate species (Su) with RA% ranging between 2% and 12%, (iii) dominant species (Do) with RA% >12.

The abundance-based α -diversity of each wetland in each plot was quantified using Hill Numbers (qD). The q values used were the following: (i) $q = 0$ which reflects species richness, (ii) $q = 1$ equals the exponential of Shannon's entropy index, and (iii) $q = 2$ equals to the inverse of Simpson's concentration index (Chao et al. 2014). The nonparametric asymptotic estimator Chao estimator of the first order (Chao1) and ACE were calculated to estimate spider species richness in each plot. The rarefaction and extrapolation curves were performed by

the usage of online package iNext in order to provide an estimate of the cumulative species richness.

Beta diversity analysis

In order to compare the spatiotemporal beta diversity of ground beetle taxocenoses, the qualitative (Jaccard) and the quantitative (Bray-Curtis) indices were calculated. Spiders represent an often-used indicator taxonomic group for biodiversity (Thiele 1977). The indicator species analysis (ISA) aims to identify the species associated with each type of habitat and to assess the extent of this association, according to their abundance (Dufrêne and Legendre 1997). A one-way analysis of similarity (ANOSIM) was applied to determine the differences in spider communities among plots.

Statistical tests

Number of individual values was summarized for each plot by the usage of descriptive statistics *viz.* sum, mean, standard deviation 'SD', Skewness, Kurtosis. The homoscedasticity and the normality of data were verified with Bartlett tests and Shapiro-Wilk tests respectively. Non-parametric Kruskal-Wallis test, parametric ANOVA test, and Post Hoc tests (Dunn's and Tukey's pairwise) were applied to examine differences between plots for spiders' abundances (N) and for environmental factors. The generalized mixed models (GLM) were performed to test the effect of environmental factors on the number of individuals (N) and the species richness (S), using a normal distribution and identity link function. All statistical analyses were performed by using the Past 5.0 (Hammer et al. 2001).

Part I - Understanding the Purpose of the M&M Section

1. What is the role of the Materials and Methods section?

The M&M section explains:

- where the study was conducted,
- how samples were collected,
- which methods were used,
- and how data were analyzed.

It allows other scientists to:

- understand the reliability of the study,
- reproduce the experiment,
- and evaluate the scientific quality of the research.

Part II - Step-by-Step Analysis of the Article

A. Study Area Analysis

2. Identify the study sites

Questions

1. What are the names of the studied wetlands?

-
2. In which country and region are they located?

-
3. Why are these wetlands important?

3. Understand site selection criteria

Exercise

List four criteria used to choose the sampling plots.

1. _____
2. _____
3. _____
4. _____

4. Climate analysis

Questions

1. Which meteorological station provided climatic data?

2. What climatic indices were calculated?

3. What was the driest month?

4. What was the rainiest month?

5. Vegetation analysis

Exercise

Complete the table:

Plot	Dominant vegetation
Plot1	
Plot2	
Plot3	
Plot4	

B. Sampling Procedure Analysis

6. Sampling design

Questions

1. How many sampling points were installed in each plot?

2. What type of trap was used?

3. How often was sampling conducted?

4. During which months was the study carried out?

7. Scientific reasoning

Discussion

Why do you think the researchers placed sampling points at least 20 m apart?

C. Laboratory and Environmental Measurements

8. Soil analysis

Exercise

Name four soil parameters measured during the study.

1.

2.

3.

4.

9. Vegetation measurements

Question

Which method was used to estimate vegetation cover?

D. Data Analysis Interpretation

This part is the most important when analyzing a scientific article.

10. Alpha Diversity Analysis

Understand the concept

Definition

Alpha diversity measures biodiversity within a single habitat or sampling site.

Questions

1. What does relative abundance (RA%) represent?

2. What are the three categories of species according to DST classification?

3. Which Hill number corresponds to species richness?

$q=0$

4. Which Hill number corresponds to Shannon diversity?

$q=1$

5. Which Hill number corresponds to Simpson diversity?

$q=2$

11. Beta Diversity Analysis

Understand the concept

Definition

Beta diversity compares species composition between habitats or sites.

Questions

1. Which index was used for qualitative comparison?

2. Which index was used for quantitative comparison?

3. What is the purpose of Indicator Species Analysis (ISA)?

4. Why was ANOSIM applied in this study?

E. Statistical Analysis Interpretation

12. Statistical tests used

Exercise

Match each test with its role.

Statistical test	Function
Shapiro–Wilk test	a. Compare differences between groups
Bartlett test	b. Verify normality
ANOVA	c. Verify homoscedasticity
GLM	d. Study effects of environmental factors

13. Understanding GLM

Question

What variables were tested using the generalized linear models (GLM)?

Part III — Critical Analysis of the Article

14. Evaluate the methodology

Questions

1. Do you think the sampling duration was sufficient? Why?

2. What are the strengths of this methodology?

3. Mention one possible limitation of the study.

Part IV — Scientific Vocabulary

15. Define the following terms

Term	Definition
Alpha diversity	
Beta diversity	
Bioindicator	
Relative abundance	
Species richness	

Part V — Writing Activities

16. Write a short summary of the M&M section (60 words maximum).

17. Explain why environmental variables are important in biodiversity studies.

Tuto 12

Bas du formulaire

Your Name
Your Address
Your Email

Date: _____

To the Rector of [University Name]

Subject: Application for Admission

Dear Rector,

I am writing to express my sincere interest in studying at your university. I would like to apply for admission to the program of _____ for the academic year _____.

I am highly motivated to continue my studies in this field because I am passionate about learning and research. Your university is internationally recognized for the quality of its education and academic environment, which encourages me to pursue my studies there.

I believe that studying at your institution will help me improve my knowledge, develop my skills, and achieve my professional goals. I am a serious and motivated student, ready to contribute positively to university life.

I would be very grateful if you would consider my application. I remain at your disposal for any additional information or documents.

Please accept, Dear Rector, the expression of my highest consideration.

Signature

Exercise 1: Identify the parts of the letter

Part of the letter	Example from the model
Greeting	
Subject	
Motivation	
Closing formula	

Exercise 2 : Answer the questions

1. Why does the student want to study at this university?

2. What qualities does the student mention about himself/herself?

3. What is the purpose of the letter?

Exercise 3 : Writing Activities

Activity 1

Write a short formal letter to a rector asking for information about a Master's program.

Activity 2

Write a letter to apply for a scholarship at a foreign university.

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