PLS201: BIOLOGY OF SEEDLESS PLANTS (Cryptogams)

Contents

Spore plants (Cryptogams)

Introduction

This first lecture is going to introduce us to spore-producing plants or seedless plant, as recently called by the NUC syllabus. In the old syllabus, spore-producing plants were Cryptogams. The latter includes both the non-vascular (algae, fungi, lichen and bryophyte) and vascular (pteridophyte). It is essential to know that of the six kingdoms of organisms (Monera, Archaea, Protists, Fungi, Plantae and Animalia) on earth, 50% of the kingdoms belong to the cryptogams. In this lecture, spore or seedless plant shall interchangeably use throughout.

Objectives

At the end of this lecture, we will be able to:

- acquire needed skills to identify the different types of cryptogams around us
- apply achieved knowledge to explain cryptogams roles in the ecosystems
- evaluate the ecology and economic importance of the various cryptogams

Main content

The term cryptogam is from Greek kryptos=hidden, gamos=marriage. It means “hidden sex cells”. Cryptogam is a collective name for five groups of spore plants (algae, fungi, lichen, bryophyte and pteridophyte). On the other hand, the seed plants known as Phanerogam (phaneros=visible gamos=marriage. Unlike the flowering plants, cryptogams never known to produce flowers, and they only reproduce by spores.

Background of cryptogams

The Cryptogams, which are non-flowering plants, are less conspicuous to the detection of an observer. For us to appreciate the work of nature through cryptogams, it is often necessary to use a hand lens and microscope to view them. There are about 250,000 species of cryptogams of which only 10% have identified and classified and named. Despite their importance to almost all of the different ecosystems, cryptogams are most poorly understood, such that little known about this group of the plant. The low percentage of the known species of cryptogams could be attributable to lack of interest and often overlooked.

Members of cryptogams

Cryptogam is a collective name that includes the algae, fungi, lichen (=blue-green algae/algae/ fungi), bryophytes (=liverworts, hornworts and mosses) and pteridophytes (=ferns and fern allies).

General Characteristics of cryptogams

All cryptogams have one feature that sets them apart, from all other plants. They have "hidden reproductive organ". Hence the name "Crypto"=hidden, and "gam"=reproductive parts. We should note that many of the characteristic features of the different groups of cryptogam are microscopic. The general characteristics are enumerated here.
All spore plants:

1. are green except for the fungi
2. have hidden reproductive organs
3. lack flowers and often overlooked
4. occupy the basal portion of almost all natural ecosystems
5. rarely found in extremely harsh environments (e.g. extreme hot or cold)
6. are found commonly in humid places on soil, decay woods or tree trunks

Form/ habit

Cryptogams have diverse forms such as unicellular, multicellular, colonial, filamentous, and thalloid. Each cryptogam form we shall discuss in great details in our subsequent lectures.

Habitats of Cryptogams

Cryptogams are found mostly in unusual places where most other plants could not have survived. Where we find a seed plant growing, cryptogams pre-exist there. Cryptogams commonly found in habitat listed here.

1. Rock surface submerged in fast-flowing rivers or streams
2. Surfaces of artificial structures
3. Woodland swampy floors
4. Surfaces of trees
5. Pond or lake
6. Soil
7. Marine and freshwater

Ecological Importance of Cryptogams

Cryptogams are nature's recyclers; they help maintain the healthful condition of natural ecosystems. Other ecological importances of cryptogams include binding of soil surface against erosion, monitoring pollution. The algal bloom is an indicator of a poisoned water body, The toxins produced by the bloom are harmful to aquatic organisms and fishermen

Economic uses of Cryptogams

After the use of the concept of alternation of generation as exhibited by cryptogams, they are economically important as food sources and detoxifiers in almost all ecosystems of the world.

Summary

Having studied this lecture note, we should:

- be ready to look around our environment for the common cryptogams
- know those characters that separate any cryptogam from the rest
- better awareness of the ecological importance of the cryptogams
- be ready to identify the different types of cryptogam around.

Conclusion

This lecture introduced students to the group of lower plants that primarily reproduce by spores. In our subsequent lectures, we shall discuss in great details each member of the spore plants.

References/further readings

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Tutorial-marked questions

1) List the plant members that are collectively known as cryptogams

2) List all attributes that distinguish a cryptogam from a phanerogam

3. Distinguish between “Cryptogram” and “Cryptogam”