



3^{Thd} year (Bot&Chem)
Date : 05 / 01 / 2019
Time: 2 Hour

Benha University

Faculty of science

Botanyµ Department

Plant communities (342 n)- (80 Mark)

Answer the following questions:

- 1- **Discuss the evolution of vegetation .** (20 mark)

- 2- **Write on :** (20 mark)
 - a) Type of vegetation .
 - b) Life form .

- 3- **Compare between :** (20 mark)
 - a) (Hydrosere – Xerosere) succession .
 - b) (Phytoplankton – Floating) stage of hydrosere succession .

- 4- **Explain :** (20 mark)
 - a) The qualitative of plant community .
 - b) Quadrata method of sampling the vegetation .

نموذج اسئله واجوبه ماده مجتمعات نباتيه 342ن

تاريخ الامتحان 2019-1-5

استاذ المادة د احمد عبدالرازق عبدالله كلية العلوم

Answer the following questions:

1- Discuss the evolution of vegetation.

The origin of a vegetation begins with invasion when propagation organs like spores, seeds, rhizomes, etc. leave the parent place and arrive in a bare area by migration of wind, water, animals and man. Many of these migrants disappear because the environmental conditions are unfavorable but favorable geminate in the new area and some of them continue their growth into mature plants. The process by which the migrants establish themselves in the new area after germination of seeds to give seedlings, growth of seedlings to give mature plants and reproduction of mature plants to give a new generation.

Emesis results into colonization of the new area after which further propagation and reproduction lead to grouping of plants in a process termed aggregation.

Aggregation sooner or later results in competition which occurs usually where two or more plants make demand for light space, nutrients or water. 4

Competition increase with the increase of population.

Only the stronger plant survives and continues its life cycle and the weak plant dies. The surviving plants react upon the place in which they grow in a process called reaction, i.e. effects of the established plants on the environment. The plants interact on the habitat and modify the environment.

Humus accumulated, dry areas become moist, wet areas become drier by the absorption and transpiration of large amount of water by the plants. Owing to the shade caused by the plant, the temperature become lower and the air becomes humid.

Reaction is not an indefinite process but a plant is re acted where the vegetation in equilibrium with the environment.

Climax is defined as the final stage of vegetation development which being in harmony with the environment is more or less permanent. The development of vegetation may be arrested in the sub-final stage of repeated burring, cutting, grazing, flooding and other causes. This imperfect stage of development by natural or artificial factors, other than climate is termed sub-climax.

On the other hand, vegetation more advanced than surrounding climax due to locally more favorable conditions obtaining in its limited area is termed **post-climax**.

2- Write on :

a- Type of vegetation .

The vegetation is either:

a) natural b) artificial c) semi-artificial natural

Natural vegetation that comes out as a result of the environmental factors without man's interference e.g. forests, grasslands, desert.

b- Artificial vegetation is formed by man's interference and includes all sorts of agriculture, horticulture and a forestation

in which man`s interfere partially the vegetation is called c-
semi-natural

b-Life form .

The life form is evolved in direct response to the climatic factors. The proportion of life forms in an area will give a good indication of its climatic zone . Raunkiaer was the first to use life form to construct biological spectra . His simple system depending on the position of the vegetative perennating buds or persistent stem apices in relation to ground level during the unfavourable season of the year. He established the following types:

I- Phanerophytes:-

The perennating buds or shoot apices borne on aerial shoots ranging from 25cm to 30cm. The plants may be evergreen.

II- Chamaephytes:-

The Perennating buds or shoot apices borne very close to the ground Erect aerial shoot die in an unfavourable season of the year Perennating buds arise on the lower portions. 16

III- Hemicryptophytes:-

It may be classified into:

- 1- Lower most leaves are less perfectly developed than the upper ones .
- 2- Leaves from a rosette at the base of the aerial shoot.
- 3- The leaves are restricted to a rosette at the base of the aerial shoot.

IV- Cryptophytes:-

1- Geophytes:- Rhizome, bulb or tuber geophytes, over wintering by food stores under ground from which arise the buds.

2- Helophytes:- Those plants which have their perennating organs in soil or mud below water level .

3- Hydrophytes:- Those plants with their perennating buds under water and their leaves submerged or floating.

V- Therophytes:

Annual species which complete their life history from seed to seed during the favourable season of the year.

3- Compare between

a- (**Hydrosere – Xerosere**) **succession**

- **Hydro sere** the plant succession which starts in the aquatic environment is called hierarch a series of changes taking place in the vegetation of hierarch. A series of changes taking place in the vegetation of hydric is called hydrsere. 48

- **Xerosere** when the vegetational succession develops in xeric or dry habitat, it is called xerarch or xerosere.

It may be of two types: (a) **psammosere succession** that begins on the sandy habitat.

(b) **Lithosere succession** that occurs on the rock.

b-(Phytoplankton – Floating) stage of hydrosere succession .

Phytoplankton stage. The simple forms of life like bacteria, algae and many other aquatic plants (phytoplankton) and animals (zooplankton) floating in water are the pioneer colonizers.

All these organisms add large amount of organic matter and nutrients due to their life activities and after their death, they settle at bottom of pond to form a layer of muck. 9

- Floating stage

When the depth of water reaches about 4 to 8 feet, the submerged vegetation starts disappearing from its original place and then the floating plants make their appearance gradually in the area.

The floating plants are of two types:

(a) Plants rooted at the bottom but which have stems or leaf petioles rising nearly to the top of water so that their leaves float at the surface ,e.g Nymphaea , Potamogeton.

(b) Plants not rooted at the bottom but which have stem(rhizomes, stolons .) with adventitious roots come

under water surface while their leaves are floating over the water surface e.g Echhornia , Pistia .

Due to continuous interaction between plant communities and aquatic environment the habitate become changed physically and chemically. Dead remains of plants are deposited at the bottom.

4- Explain :

a- The qualitative of plant community .

The qualitative structure and composition of plant community can be described on the basis of visual observations without any special sampling and measurement.

1- Floristic composition or species of community

2- Stratification and aspection

1₁ – ground stratum like mosses, thallophytes, lichens, etc.

1₂ – herbaceous or ground flora.

1₃ – middle layer or shrubby layer, and.

1₄ – top layer or canopy layer of trees.

1₅ – grasslands even two to three strata may be distinguished.

3- Life form

On the basis of general appearance and growth, the species of community are grouped into different life-form classes.

4- Sociability

In a plant community, the individuals of species are not evenly distributed. The space relationship of plants is referred to as sociability. ¹⁹

5- Interspecific associations

- (i) the species can live in similar environment.
- (ii) the species in question have similar geographical distribution.
- (iii) the species belong to different life-forms (this reduces the competition).
- (iv) the plants of one species are related to the plants of other species.

a- Quadrature method of sampling the vegetation .

The quadrature is a square sample plot or unit for a detailed of vegetation it is actually the sample _ plot method of Clements(1898) . It may be a single sample plot or may be divided into several subplots.

kinds of quadrates

(i) list quadrates

When the organisms encountered in the sample plot are listed by their names, the quadrature is called list

quadrate. It includes all the species botanically identified or otherwise

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(ii) Count quadrat or list -count quadrat

when the species name and the number of individuals of each species found in the sample area are recorded

(iii) cover quadrat

When the actual or relative coverage is recorded usually as percentage of ground area covered or shaded by vegetation the sample is known as cover quadrat.

(iv) chart quadrat

Quadrats that are mapped to scales to show the location of individuals of species are called chart quadrats.