LIFE CYCLE OF ALGAE pdf

1: Life Cycle in Algae

Ã˜ Haplontic life cycle is the most primitive and simplest type of life cycle Ã˜ Other types of life cycles in algae are developed from this type Ã˜ Example: Most of the green algae such as Chlamydomonas and Ulothrix.

The six most important life-cycle patterns found in the algae are listed below: Many life-cycle patterns are found in algae. However, there is no regular and fixed alternation of generations, as found in higher plants. In blue-green algae, and certain Chlorophyceae e. This is the simplest and most primitive type of life-cycle. The other patterns of life-cycle have originated from this type. This type is found in all Chlorophyceae except a few. Sometimes this is called Ulothrix or Chlamydomonad type. In such cases, the somatic phase plant is haploid gametophyte while the diploid phase sporophyte is represented by zygote. During germination, the zygote 2n divides meiotically producing haploid n zoospores, which develop into individual plants. Here the unicellular e. The haploid filamentous plants are known as haplonts which reproduce asexually by zoospores or aplanospores producing the individuals like parents. This pattern is reverse of Haplontic type. In this case, somatic phase plant is diploid sporophyte 2n while the haploid phase gametophyte n is restricted to gametes which are produced by meiotic division. After gametic union, a diploid zygote is formed, which develops into a diploid sporophyte 2n plant by mitotic division. The well known examples of this pattern are â€” Fucus, Sargassum, Codium, Bryopsis, etc. In this type, there are two exactly similar morphologically identical somatic phases plants showing alternation of generations. Among Chlorophyceae, this is found in Ulvaceae, Chaetophoraceae and Cladophoraceae. The orders Ectocarpales, Cutleriales, Tilop- teridales, Sphacelariales and Dictyotales of Phaeophyceae also exhibit this pattern of life-cycle. In such cases, the zygote develops into a diploid multicellular plant sporophyte by postponement of meiosis. Prior to zoospore meiospore formation there is meiosis. These zoospores n develop into haploid plants gametophyte n. The haploid plants produce gametes n which after fusion develop into zygotes 2n. This pattern of life-cycle is exactly like that of preceding one isomorphic type only with the difference that the alternating haploid n and diploid 2n somatic phases plant are, morphologically different. In such cases, the diploid multicellular sporophytic plant produces haploid zoospores meiospores by meiosis. These zoospores develop into game- tophytes. Each gametophytic plant n produces gametes which after their union form a zygote and the latter develops into a diploid sporophytic plant by mitotic divisions. This pattern is found in Laminariales, Sporochnales, Desmarestiales, etc. In this pattern, there are three phases in the life-cycle. Out of three, two phases are haploid n and one diploid 2n. The examples are found among Nemalionales e. For example, in Batrachospermum a haploid gametophytic phase produces gametes which on fusion form a zygote 2n. The latter is the only diploid phase which divides meiotically forming a haploid asexual phase known as carposporophyte. The latter reproduces asexually by haploid carpospores which again develop into gametophytes haploid plants n. Thus two morphologically different haploid phases gametophyte and carposporophyte alternate with the zygote 2n. This type of life-cycle is found in almost all Rhodophyceae except Nemalionales. The most common example is Polysiphonia of order Ceramiales. Here the life-cycle is triphasic and involves an alternation of two diploid 2n or sporophytic generations, i. Thus there are two diploid phases and one haploid phase. The gametophyte produces gametes which unite and form a zygote 2n. Now the zygote divides mitotically forming a carposporophyte 2n bearing diploid 2n carpospores. On germination, these diploid carpospores form another diploid plant, the tetrasporophyte. The latter produces tetraspores by meiosis. The haploid tetraspores germinate and give rise to haploid gametophytic plants. Thus, there are several patterns of life-cycle in algae, and there is no regular and fixed alternation of generations, as found in higher plants.

LIFE CYCLE OF ALGAE pdf

2: Life Cycle Of Algae - Oilgae - Oil from Algae

The haploid life cycle is very common in single-celled organisms like algae, either planktonic (free floating) or filamentous (anchored). The process occurs thousands of times a day and is dependent on a number of factors for its success, including water temperature, sunlight availability, nutrient content of the water and water pH.

Life Cycle Many life-cycle patterns are found in algae. However, there is no regular and fixed alternation of generation, as found in higher palnts. In blue-green algae and certain chlorophyceae which reproduced asexually, there is n alternation generation. This is a simplest and most primitive type of life-cycle. The other pattern of life-cycle have originated from this type. This type is found in all chlorophyceae. In such cases the somatic phasse plant is haploid Gametophyte while the diploid phase sporophte is represented by zygote. During germination the zygote 2n divides meiotically producing haploid n zoospores, which develop into individual plant. Here the unicellular or filamentous gametophyte n alternates with one-celled zygote or sporophyte 2n. The haploid filamentous plants are known as haplonts which reproduce asexually by zoospores or aplanospores producing the individals like parents. This pattern is reverse of haplontic type. In this case somatic phase plant is diploid sporophyte 2n while the haploid phase gametophyte is restricted to gmetes which are produced by meiotic division. After gametic union a diploid zygote is formed, which develops into a diploid sporophyte 2n plant by mitotic divisions. In this type there are two exactly similar somatic phases morphologically identical plants showing alernaion of generations. Here the one phase is diploid sporophyte 2n while the other haploid gametophyte n. This pattern of life cycle is found in ulvaceae, chaetophoraceae, cladophoraceae in chlorophyceae and ectocarpales, dictyotaes of phaeophyceae. In such cases, the zygote develops into a diploid multicellular plant sporophyte by postponement of meiosis. Prior to zoospore meiospore formation thee is meiosis. These zoospores n develop into haploid plants gametophyte n. The haploid plants prouce gametes n which after fusion develop int zygote 2n Hateromorphic type: This pattern of life cycle is exactly like that of the preceding one isomorphic type only with the difference that the alternating haploid n and diploid 2n somatic phases plant and morphologically different. In such cases the diploid multicellular sporophytic plants produces haploid zoospores meiospores by meiosis. In this patern there are three phases in the life cycle. Out of three phases two phases are haploid n and one diploid 2n. A haploid gametophytic phase produces gametess which on fusion form a zygote 2n. The latte is the only diploid phase which divides meiotically forming a haploid asexual phase known as carposporophyte. The latter reproduce asexually by haploid carpospores which again develop into gametophytes haploid plants n. Thus two morphologically different haploid phases gametophyte and carposporophyte alternate with the zygote 2n Diplobiontic type: This type of life cycle is found in almost all Rhodophyceae except Nemalionales. Here the life cycle is triphasic and involves an alternation of two diploid 2x or sporophytic generations. Thus there are two diploid phases and one haploid phase. Now the zygote divides mitotically forming a carposporophyte 2x bearing diploid 2x carpospores. On germination these diploid carpspores form another diploid plant, the tetrasporophyte. The latter produce tetraspores by meiosis. The haploid tetraspores erminate and give rise to haploid gametophytic plants. Thus there are several pattern of life cycle in algae and there is no regular and fixed alternation of generations as found in higher plants.

LIFE CYCLE OF ALGAE pdf

3: Life cycle of Polysiphonia (Rhodophyta Red algae)

Diplohaplontic life cycle: In this stage, both forms of the plant organism exists as both a haploid an diploid and both produce gametes and continue their life cycle as mentioned earlier. The algae reproduce by both these methods by both sexual methods as is the case with gametophytes and asexual as is the case with Diploid sporophytic plants.

The sporophyte is the dominant generation, but multicellular male and female gametophytes are produced within the flowers of the sporophyte. Cells of the microsporangium within more Mosses are heterosporous, which means they make two distinct types of spores; these develop into male and female gametophytes. Male gametophytes develop reproductive structures called antheridia singular, antheridium that produce sperm by mitosis. Female gametophytes develop archegonia singular, archegonium that produce eggs by mitosis. Sperm travel to a neighboring plant via a water droplet, are chemically attracted to the entrance of the archegonium, and fertilization results. The sporophyte is not photosynthetic. Thus both the embryo and the mature sporophyte are nourished by the gametophyte. Meiosis within the capsule of the sporophyte yields haploid spores that are released and eventually germinate to form a male or female gametophyte. Ferns follow a pattern of development similar to that of mosses, although most but not all ferns are homosporous. That is, the sporophyte produces only one type of spore within a structure called the sporangium Figure One gametophyte can produce both male and female sex organs. The greatest contrast between the mosses and the ferns is that both the gametophyte and the sporophyte of the fern photosynthesize and are thus autotrophic; the shift to a dominant sporophyte generation is taking place. The sporophyte generation is photosynthetic and is independent of the gametophyte. The sporangia are protected by a layer of cells called the indusium. This entire structure is called a sorus. Meiosis within the more At first glance, angiosperms may appear to have a diplontic life cycle because the gametophyte generation has been reduced to just a few cells Figure However, mitotic division still follows meiosis in the sporophyte, resulting in a multicellular gametophyte, which produces eggs or sperm. All of this takes place in the the organ that characterizes the angiosperms: Male and female gametophytes have distinct morphologies i. Rather, wind or members of the animal kingdom deliver the male gametophyteâ€”pollenâ€”to the female gametophyte. Another evolutionary innovation is the production of a seed coat, which adds an extra layer of protection around the embryo. The seed coat is also found in the gymnosperms. A further protective layer, the fruit, is unique to the angiosperms and aids in the dispersal of the enclosed embryos by wind or animals. The remainder of this chapter provides a detailed exploration of angiosperm development from fertilization to senescence. Keep in mind that the basic haplodiplontic life cycle seen in the mosses and ferns is also found in the angiosperms, continuing the trend toward increased nourishment and protection of the embryo. Aside from the fact that the gametophytes of mosses and other plants do not have the necessary structural support and transport systems to attain tree height, it would be very difficult for a sperm to swim up a tree! First, the gametophyte develops on the ground, where water can facilitate fertilization. Secondly, unlike mosses, the fern sporophyte has vascular tissue, which provides the support and transport system necessary to achieve substantial height. By agreement with the publisher, this book is accessible by the search feature, but cannot be browsed.

4: Life cycles algae & plants

This life cycle is also known as monogenic life cycle. This type of life cycle is found in majority of Chlorophyceae like Chlamydomonas, Ulothrix, Oedogonium, Spirogyra, Chara etc. and all members of Xanthophyceae.

Algae are important in marine, freshwater, and some terrestrial ecosystems. Seaweeds are large marine algae. The study of algae is called phycology. Algae may be unicellular, colonial, or multicellular. Some algae, like the diatoms, are microscopically small. Other algae, like kelp, are as big as trees. Some algae, the phytoplankton , drift in the water. Other algae, the epiphitic or benthic algae, grow attached to rocks, docks, plants, and other solid objects. Classification The major groups of eukaryotic algae are the green algae, diatoms, red algae, brown algae, and dinoflagellates. They are classified as protista. Another group, the blue-green algae, is the cyanobacteria. Some authorities do not consider the blue-green algae to be true algae because they are prokaryotes , not eukaryotes. Green algae are the algae most closely related to plants. They have the same pigments chlorophyll a and b and carotenoids , the same chemicals in their cell walls cellulose , and the same storage product starch as plants. Green algae may be unicellular or form filaments, nets, sheets, spheres, or complex mosslike structures. There are both freshwater and marine species. Some species of green algae live on snow, or in symbiotic associations as lichens, or with sponges or other aquatic animals. Edible green algae include Chlorella and sea lettuce. There are at least seventeen thousand species of green algae. Diatoms are often regarded as the most beautiful of the algae. Each diatom has a cell wall made of glass that is very finely etched with a species-specific pattern of dots and lines. The patterns on the diatom cell walls are so precise that they were used for years to test the optics of new microscopes. Diatoms are also the most abundant algae in the open ocean and responsible for about one-quarter of all the oxygen gas produced on the earth each year. Diatom populations often bloom in lakes in the spring, providing a major food for zooplankton, forming the base of the aquatic food chain. There are over one hundred thousand species of diatoms. Algae on a pond. Algae are important in freshwater as well as in marine and some terrestrial ecosystems. Red algae are almost exclusively marine and include many edible and economically important species, including nori and laver. Red algae are also the source of carageenan and agar , which are used as food thickeners and stabilizers. Red algae are mostly large, complex seaweeds. There are four thousand to six thousand species. Brown algae are almost exclusively marine and include the largest and most complex seaweeds. Kelp, for example, may be more than 60 meters feet tall, and forms dense underwater forests off the California coast. Other important brown algae include the rockweeds and Sargassum, for which the Sargasso Sea is named. There are about fifteen hundred species of brown algae. Dinoflagellates are unicellular algae with armor made of cellulose and flagella that cause them to spin as they swim. Dinoflagellates are found in both freshwater and marine ecosystems. Some species of dinoflagellates emit an eerie blue light when disturbed, called bioluminescence. Other dinoflagellates are toxic and responsible for red tides and outbreaks of shellfish poisoning. There are two thousand to four thousand species of dinoflagellates. Life Cycles Life cycles among the algae are incredibly varied. In fact, almost any type of life cycle one can imagine is displayed by some member of the algae. In an asexual life cycle, individuals reproduce by splitting. Some dinoflagellates reproduce primarily by asexual division. There are three types of sexual life cycles, which involve at some stage the fusion of gametes: In the gametic meiosis life cycle which is employed by humans , meiosis produces the gametes, so the only haploid cells in the life cycle are the gametes. The individual that one sees is made of diploid cells. Diatoms have gametic meiosis. In zygotic meiosis, the zygote undergoes meiosis, so the only cell that is diploid is the zygote. All the other cells in the organism are haploid. Many of the green algae, including sea lettuce, have zygotic meiosis. In sporic meiosis, there are both haploid individuals and diploid individuals within the life cycle. Meiosis produces haploid spores, which then divide to produce an individual that is made entirely of haploid cells. This individual produces gametes by mitosis. Two gametes unite and form a diploid zygote. The zygote divides to produce an individual that is made entirely of diploid cells. This individual produces spores by meiosis to complete the cycle. Because the life cycle includes two generations of individuals, a haploid generation and a diploid generation, it is called "alternation of generations. In Japan, Korea, and China, the production of nori is a billion-dollara-year industry, but because the two generations in the nori life cycle look completely unlike each other it was not until the early twentieth century that the second generation was discovered. This discovery radically improved the ability of humans to grow nori, and there is a memorial park in Japan dedicated to the British scientist, Kathleen Drew Baker, who discovered it. Economic and Ecological Importance Algae are the base of the aquatic food chain. Humans also eat many types of algae. The marine algae nori and kelp have been harvested in China for over two thousand years. Spirulina, a blue-green algae that is rich in protein and vitamin B, is harvested from Lake Chad in Africa. The photosynthesis done by algae is very important to the biosphere because it reduces the amount of carbon dioxide and increases the amount of oxygen in the atmosphere. Some types of algae can cause environmental problems such as red tides and fishy-tasting water. These problems are usually caused by the excessive release of nutrients from farms, sewage, and other human activities. The outbreak of the nerve-toxin-producing Pfiesteria a dinoflagellate on the Atlantic coast, for example, has been linked to overflowing sewage lagoons. Algae and Human Affairs. Cambridge University Press, Evert, and Susan E. Biology of Plants, 6th ed. Freeman and Company, Other articles you might like:

LIFE CYCLE OF ALGAE pdf

5: The Haploid Life Cycle

A haploid life cycle is found in most fungi and in some green algae like Chlamydomonas. Haplo-diplontic: In haplo-diplonts the mitoses occur in both diploid and haploid cells.

Bring fact-checked results to the top of your browser search. Reproduction and life histories Algae regenerate by sexual reproduction, involving male and female gametes sex cells , by asexual reproduction , or by both ways. A species of yellow-green alga called Vaucheria sessilis is an example of a sexually reproducing alga. The reproductive structures consist of an antheridium, which contains male gametes, and two oogonia, which contain female gametes. Asexual reproduction is the production of progeny without the union of cells or nuclear material. Many small algae reproduce asexually by ordinary cell division or by fragmentation, whereas larger algae reproduce by spores. Some red algae produce monospores walled, nonflagellate, spherical cells that are carried by water currents and upon germination produce a new organism. Some green algae produce nonmotile spores called aplanospores , while others produce zoospores , which lack true cell walls and bear one or more flagella. These flagella allow zoospores to swim to a favourable environment , whereas monospores and aplanospores have to rely on passive transport by water currents. Sexual reproduction is characterized by the process of meiosis , in which progeny cells receive half of their genetic information from each parent cell. Sexual reproduction is usually regulated by environmental events. In many species , when temperature, salinity, inorganic nutrients e. A sexually reproducing organism typically has two phases in its life cycle. In the first stage, each cell has a single set of chromosomes and is called haploid , whereas in the second stage each cell has two sets of chromosomes and is called diploid. When one haploid gamete fuses with another haploid gamete during fertilization, the resulting combination, with two sets of chromosomes, is called a zygote. Either immediately or at some later time, a diploid cell directly or indirectly undergoes a special reductive cell-division process meiosis. Diploid cells in this stage are called sporophytes because they produce spores. During meiosis the chromosome number of a diploid sporophyte is halved, and the resulting daughter cells are haploid. At some time, immediately or later, haploid cells act directly as gametes. In algae, as in plants, haploid cells in this stage are called gametophytes because they produce gametes. The giant kelp species Macrocystis pyrifera reproduces sexually and has distinct haploid and diploid stages. The reproductive behaviour of Macrocystis pyrifera is heavily influenced by water temperature and the availability of nutrients. Copyright Richard Herrmann The life cycles of sexually reproducing algae vary; in some, the dominant stage is the sporophyte, in others it is the gametophyte. For example, Sargassum class Phaeophyceae has a diploid sporophyte body, and the haploid phase is represented by gametes. Ectocarpus class Phaeophyceae has alternating diploid and haploid vegetative stages, whereas Spirogyra class Charophyceae has a haploid vegetative stage , and the zygote is the only diploid cell. The brown algae known as Sargassum is sometimes called sea holly because of its berrylike floating bulbs and its branching thallus body. Most species of Sargassum reproduce sexually. Zygospores generally have a large store of food reserves and a thick, resistant cell wall. Following an appropriate environmental stimulus, such as a change in light, temperature, or nutrients, the zygospores are induced to germinate and start another period of growth. Algae in the genus Bambusina, a group of freshwater desmids in the division Chlorophyta green algae , are capable of forming zygospores and therefore entering a state of dormancy. Courtesy of Robert A. Andersen Most algae can live for days, weeks, or months. Small algae are sometimes found in abundance during a short period of the year and remain dormant during the rest of the year. In some species, the dormant form is a resistant cyst, whereas other species remain in the vegetative state but at very low population numbers. Some large, attached species are true perennials. They may lose the main body at the end of the growing season , but the attachment part, the holdfast, produces new growth only at the beginning of the next growing season. The red algae , as exemplified by Polysiphonia , have some of the most complex life cycles known for living organisms. Following meiosis, four haploid tetraspores are produced, which germinate to produce either a male or a female gametophyte. When mature, the male gametophyte produces special spermatangial branches that bear structures, called spermatangia, which contain spermatia, the male gametes. The female gametophyte produces special carpogonial branches that bear carpogonia, the female gametes. Fertilization occurs when a male spermatium, carried by water currents, collides with the extended portion of a female carpogonium and the two gametes fuse. The fertilized carpogonium the zygote and the female gametophyte tissue around it develop into a basketlike or pustulelike structure called a carposporophyte. The carposporophyte eventually produces and releases diploid carpospores that develop into tetrasporophytes. Certain cells of the tetrasporophyte undergo meiosis to produce tetraspores, and the cycle is repeated. In the life cycle of Polysiphonia, and many other red algae, there are separate male and female gametophytes, carposporophytes that develop on the female gametophytes, and separate tetrasporophytes. The life cycles of diatoms , which are diploid, are also unique. Diatom walls, or frustules, are composed of two overlapping parts the valves. During cell division, two new valves form in the middle of the cell and partition the protoplasm into two parts. Consequently, the new valves are generally somewhat smaller than the originals, so after many successive generations, most of the cells in the growing population are smaller than their parents. When such diatoms reach a critically small size, sexual reproduction may be stimulated. The small diploid cells undergo meiosis, and among pennate thin, elliptical diatoms the resulting haploid gametes fuse into a zygote, which grows quite large and forms a special kind of cell called an auxospore. The auxospore divides, forming two large, vegetative cells, and in this manner the larger size is renewed. In centric diatoms there is marked differentiation between nonmotile female gametes, which act as egg cells, and motile typically uniflagellate male gametes.

LIFE CYCLE OF ALGAE pdf

6: Life cycle in Algae | Plant Science 4 U

The six most important life-cycle patterns found in the algae are listed below: Many life-cycle patterns are found in algae. However, there is no regular and fixed alternation of generations, as found in higher plants. In blue-green algae, and certain Chlorophyceae (e.g., Protococcus, Scenedesmus.

Bring fact-checked results to the top of your browser search. Life cycle of fungi In the life cycle of a sexually reproducing fungus, a haploid phase alternates with a diploid phase. The haploid phase ends with nuclear fusion , and the diploid phase begins with the formation of the zygote the diploid cell resulting from fusion of two haploid sex cells. Meiosis reduction division restores the haploid number of chromosomes and initiates the haploid phase, which produces the gametes. In the majority of fungi, all structures are haploid except the zygote. Nuclear fusion takes place at the time of zygote formation, and meiosis follows immediately. Only in Allomyces and a few related genera and in some yeasts is alternation of a haploid thallus with a diploid thallus definitely known. In the higher fungi a third condition is interspersed between the haploid and diploid phases of the life cycle. In these fungi, plasmogamy fusion of the cellular contents of two hyphae but not of the two haploid nuclei results in dikaryotic hyphae in which each cell contains two haploid nuclei, one from each parent. Eventually, the nuclear pair fuses to form the diploid nucleus and thus the zygote. In the Basidiomycota , binucleate cells divide successively and give rise to a binucleate mycelium , which is the main assimilative phase of the life cycle. It is the binucleate mycelium that eventually forms the basidia â€”the stalked fruiting bodies in which nuclear fusion and meiosis take place prior to the formation of the basidiospores. The asexual cycle produces mitospores, and the sexual cycle produces meiospores. Even though both types of spores are produced by the same mycelium, they are very different in form and easily distinguished see above Sporophores and spores. The asexual phase usually precedes the sexual phase in the life cycle and may be repeated frequently before the sexual phase appears. Some fungi differ from others in their lack of one or the other of the reproductive stages. For example, some fungi reproduce only sexually except for fragmentation, which is common in most fungi , whereas others reproduce only asexually. A number of fungi exhibit the phenomenon of parasexuality, in which processes comparable to plasmogamy, karyogamy, and meiosis take place. However, these processes do not occur at a specified time or at specified points in the life cycle of the organism. As a result, parasexuality is characterized by the prevalence of heterokaryosis in a myceliumâ€"i.

LIFE CYCLE OF ALGAE pdf

7: 4 Main Patterns of Life Cycle in Algae

Life Cycle in Algae. The growth and development consists of a number of distinct morphological and cytological stages. The sequence of these orderly changes is called as LIFE CYCLE.

Colonial alga such as red alga, brown alga, and green alga and filamentous alga such as red, green, and brown alga all exhibit haploid life cycle. A general life history includes both a 1n stage and a 2n stage separated by meiosis and syngamy. After the zygote goes through meiosis, it develops into a haploid 1n spore or some other 1n structure. Meiosis produces four cells from each zygote and these four cells can be spores or other structure, depending on the organism. The four cells would then go through mitosis and become the organism. The organism has two options but not in all cases. It can either start asexual reproduction or it can produce gametes through mitosis. Isogamy and anisogamy, and sometimes oogamy may occur. The gametes then fuse in a process called syngamy, or fertilization. The fused gametes either all come from one single individual or from more than one individuals. After syngamy, the fused gametes become the zygote and become diploid again, the process repeats again. One important aspect about haploid life cycle is that only the gametophyte phase is present, the sporophyte does not exist in a haploid life cycle. Haploid life cycle occurs in green algae. Volvox, for example is a colonial green algae in which both male gametes and egg are produced in the 1n stage, which then fuse together to form a zygospore, an encysted zygote that is protected from the harsh conditions of the environment. Another green algae that exhibits 1n life cycle is the Oedogonium, which is filamentous, or a chain of cells formed in one plane. Oedogonium grows in two different ways, through zoospores, or through syngamy of sperm and egg. Volvox In the first process, zoospores mitospores escape from the zoosporangium which is located in the parent algae and they develope into filaments. The parent also contains antheridia which produce sperm 1n and an oogonium which produces the egg 1n. Syngamy occurs when the sperm and egg fuse and forms the zygote 2n. The 2n zygote then developes into the filamentous green algae. Another example is found in the fungi kingdom. Rhizopus nigricans , or black bread mold, also has a haploid life history. The sproangia produces mitospores which through mitosis developes into gametangia, or sex organs. When the gametangia fuse, syngamy occurs and produces a zygote 2n. The zygote then goes through meiosis to form new 1n spores and the life cycle repeats.

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8: Plant Life Cycles - Developmental Biology - NCBI Bookshelf

Paper-I Diversity of Microbes and Cryptograms. Experiment: Red Light vs Blue Light -How Spectrums Affect Plant Growth- LED vs CFL - Duration: AlboPepper - Drought Proof Urban Gardening.

Red algae These groups have chloroplasts containing chlorophylls a and c, and phycobilins. The shape varies from plant to plant; they may be of discoid, plate-like, reticulate, cup-shaped, spiral, or ribbon shaped. They have one or more pyrenoids to preserve protein and starch. The latter chlorophyll type is not known from any prokaryotes or primary chloroplasts, but genetic similarities with red algae suggest a relationship there. In , Samuel Gottlieb Gmelin â€" published the Historia Fucorum, the first work dedicated to marine algae and the first book on marine biology to use the then new binomial nomenclature of Linnaeus. It included elaborate illustrations of seaweed and marine algae on folded leaves. Harvey â€" and Lamouroux [26] were the first to divide macroscopic algae into four divisions based on their pigmentation. This is the first use of a biochemical criterion in plant systematics. Unlike macroalgae , which were clearly viewed as plants, microalgae were frequently considered animals because they are often motile. Throughout the 20th century, most classifications treated the following groups as divisions or classes of algae: Later, many new groups were discovered e. With the abandonment of plant-animal dichotomous classification, most groups of algae sometimes all were included in Protista , later also abandoned in favour of Eukaryota. However, as a legacy of the older plant life scheme, some groups that were also treated as protozoans in the past still have duplicated classifications see ambiregnal protists. Some parasitic algae e. In other cases, some groups were originally characterized as parasitic algae e. Furthermore, groups like the apicomplexans are also parasites derived from ancestors that possessed plastids, but are not included in any group traditionally seen as algae. Relationship to land plants[edit] The first land plants probably evolved from shallow freshwater charophyte algae much like Chara almost million years ago. These probably had an isomorphic alternation of generations and were probably filamentous. Fossils of isolated land plant spores suggest land plants may have been around as long as million years ago. A three-dimensional, multicellular thallus A range of algal morphologies is exhibited, and convergence of features in unrelated groups is common. The only groups to exhibit three-dimensional multicellular thalli are the reds and browns , and some chlorophytes. Some of the more common organizational levels, more than one of which may occur in the lifecycle of a species, are Colonial: The innovation that defines these nonalgal plants is the presence of female reproductive organs with protective cell layers that protect the zygote and developing embryo. Hence, the land plants are referred to as the Embryophytes. Physiology[edit] Many algae, particularly members of the Characeae , [41] have served as model experimental organisms to understand the mechanisms of the water permeability of membranes, osmoregulation , turgor regulation , salt tolerance , cytoplasmic streaming , and the generation of action potentials. Phytohormones are found not only in higher plants, but in algae, too. In these symbioses, the algae supply photosynthates organic substances to the host organism providing protection to the algal cells. The host organism derives some or all of its energy requirements from the algae. Lichen Rock lichens in Ireland Lichens are defined by the International Association for Lichenology to be "an association of a fungus and a photosynthetic symbiont resulting in a stable vegetative body having a specific structure. In nature they do not occur separate from lichens. It is unknown when they began to associate. A photobiont may be associated with many different mycobionts or may live independently; accordingly, lichens are named and classified as fungal species. The photobiont possibly triggers otherwise latent genes in the mycobiont. Lichen thus share some of the habitat and often similar appearance with specialized species of algae aerophytes growing on exposed surfaces such as tree trunks and rocks and sometimes discoloring them. Coral , Coral reef , and Symbiodinium Floridian coral reef Coral reefs are accumulated from the calcareous exoskeletons of marine invertebrates of the order Scleractinia stony corals. These animals metabolize sugar and oxygen to obtain energy for their cell-building processes, including secretion of the exoskeleton, with water and carbon dioxide as byproducts. Dinoflagellates algal protists are often endosymbionts in the cells of the coral-forming marine invertebrates, where they accelerate host-cell metabolism by generating sugar and oxygen immediately available through photosynthesis using incident light and the carbon dioxide produced by the host. Reef-building stony corals hermatypic corals require endosymbiotic algae from the genus Symbiodinium to be in a healthy condition. Sea sponge Endosymbiontic green algae live close to the surface of some sponges, for example, breadcrumb sponges Halichondria panicea. Asexual reproduction permits efficient population increases, but less variation is possible. Commonly, in sexual reproduction of unicellular and colonial algae, two specialized, sexually compatible, haploid gametes make physical contact and fuse to form a zygote. To ensure a successful mating, the development and release of gametes is highly synchronized and regulated; pheromones may play a key role in these processes. Another checklist reports only about 5, species. Regarding the difference of about 15, species, the text concludes: Most of these are listed in List of seaweeds of South Africa. These exclude phytoplankton and crustose corallines. Most estimates also omit microscopic algae, such as phytoplankton. The most recent estimate suggests 72, algal species worldwide. This dispersal can be accomplished by air, water, or other organisms. Due to this, spores can be found in a variety of environments: The spores of freshwater algae are dispersed mainly by running water and wind, as well as by living carriers. Ocean water presents many vastly different habitats based on temperature and nutrient availability, resulting in phytogeographic zones, regions, and provinces. It is, therefore, possible to identify species occurring by locality, such as "Pacific algae" or "North Sea algae". When they occur out of their localities, hypothesizing a transport mechanism is usually possible, such as the hulls of ships. For example, Ulva reticulata and U. Mapping is possible for select species only: Microscopic forms that live suspended in the water column phytoplankton provide the food base for most marine food chains. In very high densities algal blooms , these algae may discolor the water and outcompete, poison, or asphyxiate other life forms. Algae can be used as indicator organisms to monitor pollution in various aquatic systems. Due to this, the species composition of algal populations may shift in the presence of chemical pollutants.

LIFE CYCLE OF ALGAE pdf

9: 6 Important Life-Cycle Patterns found in the Algae

For plants and many algae, there are two multicellular stages, and the life cycle is referred to as alternation of generations. The term life history is often used, particularly for organisms such as the red algae which have three multicellular stages (or more), rather than two.

The following points highlight the four main patterns of life cycle in algae. Haplontic Life Cycle 2. Diplontic Life Cycle 3. Diplohaplontic Life Cycle 4. The plant body is gametophyte haploid and sporophyte diploid stage is represented only by zygote. The fusion between gametes results the formation of zygote, the only diploid stage i. The zygote undergoes meiotic division and forms four meiospores. These meiospores develop into haploid plants. The alternation of generations can be interpreted by chromosome number Fig. This life cycle is also known as monogenic life cycle. This type of life cycle is found in majority of Chlorophyceae like Chlamydomonas, Ulothrix, Oedogonium, Spirogyra, Chara etc. The plant body is sporophyte and develops sex organs. Sex organs produce gametes by meiosis. The gamete only represents the gametophytic stage. The gametes undergo fertilization immediately and form zygote. Fucus and Sargassum of Phaeophyceae also show this type of life cycle. In this type the haploid and diploid phases are equally prominent and are represented by two distinct vegetative individuals. They differ only in chromosome number and function. In this life cycle alternation of two vegetative individuals occurs by sporogenic meiosis and fusion of gametes. It is of two types: The zygote germinates directly into a sporophytic diploid plant. The sporophytic plant forms haploid zoospores by meiosis. These zoospores can develop new gametophytic plant. This type of life cycle is found in Clapdohora, Ulva, Draparnaldiopsis of Chlorophyceae and Ectocarpus of Phaeophyceae. Generally the sporophyte is complicated and much elaborate, but the gametophyte is simple and small as found in Laminaria of Phaeophyceae. In some cases like Cutlaria etc. In Laminaria the gametophytic plant body is made up of minute filaments which produce gametes. The gametes undergo fusion and form zygote, which germinates directly into a sporophytic plant. The sporophytic plant body is macroscopic and several meters in length. The sporophytic plant bears zoosporangia and produce zoospores after meiotic division. The haploid zoospores on germination produce haploid gametophytic plant. In this type, there is succession of three distinct generations. In this cycle the gametophytic haploid phase is elaborate, dominant and persists for long time than sporophytic diploid phase which is represented only by zygote i. In Batrachospermum the gametophytic plant body develops sex organs and produces male spermatium and female egg gametes. The gametes by fusion form zygote. The zygote immediately undergoes meiosis and produces another haploid gametophytic plant, the carposporophyte. The carposporophyte develops carposporangium which produces haploid carpospores. The carpospores germinate and develop new free-living gametophytic plant. So in this cycle, three phases are: This type of life cycle is found in Polysiphonia, a member of Rhodophyceae. In Polysiphonia, the gametophytic phase is represented by two types of gametophytic plant i. Later, the spermatangium and carpogonium develop sperms and egg respectively. The male and female gamete i. The zygote 2n develops into a diploid carpospophytic phase. The diploid carpospores are formed in the carposporophyte. The carpospores on germination develop the diploid tetrasporophytic plants. The tetrasporo- phytic plant develops diploid tetrasporangia each of which produce four tetraspores n by meiotic division. They are liberated by splitting of sporangial wall. Out of four tetraspores two produce male gametophyte and the other two into female gametophyte.

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