DOWNLOAD PDF V. 17. GYMNOSPERMS AND PTERIDOPHYTES

Chapter 1 : â€•ä¸-å•¤â€˜Pteridophytes and Gymnosperms (ãƒ•ãƒ¼ãƒ‰ã‚«ãƒ•ãƒ¼)calendrierdelascience.c

Gymnosperms are naked-seeded calendrierdelascience.com seeds are not enclosed in fruits. They do not produce flowers and they are regarded as primitive seed plants. They include mostly evergreen trees like conifers and cycads.

Plant body is sporophytic differentiated into true roots, stem and leaves. Pteris, Adiantum Angiosperms Gk. They are true flowering plants where the seeds are completely enclosed inside a fruit wall. The ovules are protected inside the ovary which later develops into fruit. Angiosperms are adapted to wide variety of environments may be mesophytes, hydrophytes, xerophytes, epiphytes etc. Pteridophytes are mostly terrestrial moisture or shade loving plants. Flowers, seeds and fruits are present. Therefore angiosperms are seed bearing plants. Flowers, seeds and fruits are absent. Therefore pteridophytes are spore bearing plants. Angiosperms vary greatly in size and shape; may be herb, shrub or tree. Pteridophytes are generally herbaceous. Xylem consists of well developed vessels and tracheids in angiosperms. Xylem lacks true vessels in Pteridophytes. In phloem, companion cells and sieve tubes are present in angiosperms. In phloem, sieve cells are present, companion cells and sieve tubes are absent in pteridophytes. In angiosperms, secondary growth is present except monocots. Secondary growth is absent in pteridophytes. Angiosperms are heterosporous forming male and female spores which is critical for seed habit. Pteridophytes are mostly homosporous. Some pteridophytes like Selaginella is heterosporous but there is no seed formation. In angiosperms, stamens and carpels are the male and female reproductive structures which are organized to form the flower. In pteridophytes, antheridium and archegonium are the male and the female sex organs. In pteridophytes, water is essential for fertilization and male gametes are ciliated. In angiosperms, megasporangium is usually large. In pteridophytes, megasporangium is usually small. In angiosperms, megasporangium is covered by one or more integuments that offers protection. In pteridophytes, integuments are absent. In angiosperms, usually a single megaspore is functional in the entire megasporangium ovule and is retained within the magasporangium. Tapetum is absent and endosperm is the nutritive tissue for the developing embryo in angiosperms. Tapetum is present, but endosperm is absent in pteridophytes.

Chapter 2 : Bryophytes vs Pteridophytes: Comparison | easybiologyclass

In gymnosperms, microspores or pollen grains are shed only for a small period, whereas the megaspore is retained permanently within the mega sporangium. 6. Due to the permanent retention of the megaspore in the ovule, it forms the seeds.

Source Credits Picture Credits: Seeds are the result of the reproductive process. They consist of the embryo along with stored food, which serves for the initial growth of the embryo during germination. This group is further classified, based on whether the seeds are naked or enclosed in fruits, giving us two groups: Gymnosperms This term is made from two greek words: The plants of this group bear naked seeds [ovules are not enclosed by any ovary wall] and are usually perennial, evergreen and woody. The seeds that develop post-fertilisation are naked too. Examples are pines, such as deodar. Gymnosperms include medium-sized trees or tall trees and shrubs. One of the gymnosperms, the giant redwood tree Seguoia is one of the tallest tree species. Roots in some genera have fungal association in the form of mycorrhiza Pinus , while in some others Cgcas small specialised roots called coralloid roots are associated with N2-fixing cyanobacteria. The leaves in gymnosperms are well-adapted to withstand extremes of temperature, humidity and wind. In conifers, the needle-like leaves reduce the surface area. Their thick cuticle and sunken stomata also help to reduce water loss. The gymnosperms are heterosporous; they produce haploid microspores and megaspores. The two kinds of spores are produced within sporangia that are borne on sporophylls which are arranged spirally along an axis to form lax or compact strobili or cones. The strobili bearing microsporophylls and microsporangia are called microsporangiate or male strobili. The microspores develop into a male gametophytic generation which is highly reduced and is confined to only a limited number of cells. This reduced gametophyte is called a pollen grain. The development of pollen grains take place within the microsporangia. The cones bearing megasporophylls with ovules or megasporangia are called macrosporangiate or female strobili. The male or female cones or strobili may be borne on the same tree Pinus. However, in cycas male cones and megasporophylls are borne on different trees. They remain within the sporangia retained on the sporophytes. The pollen grain is released from the microsporangium. They are carried in air currents and come in contact with the opening of the ovules borne on megasporophylls. The pollen tube carrying the male gametes grows towards archegonia in the ovules and discharge their contents near the mouth of the archegonia. Following fertilisation, zygote develops into an embryo and the ovules into seeds. These seeds are not covered. Unlike the gymnosperms where the ovules are naked, in the angiosperms or flowering plants, the pollen grains and ovules are developed in specialised structures called flowers. The seeds develop inside an organ which is modified to become a fruit. These are also called flowering plants. The male sex organ in a flower is the stamen. Each stamen consists of a slender filament with an anther at the tip. The anthers, following Meiosis , produce pollen grains. The female sex organ in a flower is the pistil or the carpel. Pistil consists of an ovary enclosing one to many ovules. Within ovules are present highly reduced female gametophytes termed embryo-sacs. The embryo-sac formation is preceded by meiosis. Hence, each of the cells of an embryo-sac is haploid. Each embryo-sac has a three-celled egg apparatus â€" one egg cell and two synergids, three antipodal cells and two polar nuclei. The polar nuclei eventually fuse to produce a diploid secondary nucleus. Pollen grain, after dispersal from the anthers, are carried by wind or various other agencies to the stigma of a pistil. This is termed as pollination. The pollen grains germinate on the stigma and the resulting pollen tubes grow through the tissues of stigma and style and reach the ovule. The pollen tubes enter the embryo-sac where two male gametes are discharged. One of the male gametes fuses with the egg cell to form a zygote syngamy. The other male gamete fuses with the diploid secondary nucleus to produce the triploid primary endosperm nucleus PEN. Because of the involvement of two fusions, this event is termed as double fertilisation, an event unique to angiosperms. Life cycle of an angiosperm The zygote develops into an embryo with one or two cotyledons and the PEN develops into endosperm which provides nourishment to the developing embryo. The synergids and antipodals degenerate after fertilisation. During these events the ovules develop into seeds and the ovaries develop into fruit. Plant embryos in seeds have structures called cotyledons. Thus, cotyledons

represent a bit of pre-designed plant in the seed. Monocots and Dicots The angiosperms are divided into two groups on the basis of the number of cotyledons present in the seed. Plants with seeds having a single cotyledon are called monocotyledonous or monocots. Plants with seeds having two cotyledons are called dicots. Algae [thallophytes] are chlorophyll-bearing simple, thalloid, autotrophic and largely aquatic organisms. Depending on the type of pigment possesed and the type of stored food, algae are classfied into three classes, namely Chlorophyceae, Phaeophyceae and Rhodophyceae. Algae usually reproduce vegetatively by fragmentation, asexually by formation of different types of spores and sexually by formation of gametes which may show isogamy, anisogamy or oogamy. Bryophytes are plants which can live in soil but are dependent on water for sexual reproduction. Their plant body is more differentiated than that of algae. It is thallus-like and prostrate or erect and attached to the substratum by rhizoids. They possess root-like, leaf-like and stem-like structures. The bryophytes are divided into liverworts and mosses. The plant body of liverworts is thalloid and dorsiventral whereas mosses have upright, slender axes bearing spirally arranged leaves. The main plant body of a bryophyte is gamete-producing and is called a gametophyte. It bears the male sex organs called antheridia and female sex organs called archegonia. The male and female gametes produced fuse to form zygote which produces a multicellular body called a sporophyte. It produces haploid spores. The spores germinate to form gametophytes. In pteridophytes the main plant is a sporophyte which is differentiated into true root, stem and leaves. These organs possess well-differentiated vascular tissues. The sporophytes bear sporangia which produce spores. The spores germinate to form gametophytes which require cool, damp places to grow. The gametophytes bear male and female sex organs called antheridia and archegonia, respectively. Water is required for transfer of male gametes to archegonium where zygote is formed after fertilisation. The zygote produces a sporophyte. The gymnosperms are the plants in which ovules are not enclosed by any ovary wall. After fertilisation the seeds remain exposed and therefore these plants are called naked-seeded plants. The gymnosperms produce microspores and megaspores which are produced in microsporangia and megasporangia borne on the sporophylls. The sporophylls â€” microsporophylls and megasporophylls â€” are arranged spirally on axis to form male and female cones, respectively. The pollen grain germinates and pollen tube releases the male gamete into the ovule, where it fuses with the egg cell in archegonia. Following fertilisation, the zygote develops into embryo and the ovules into seeds. In angiosperms, the male sex organs stamen and female sex organs pistil are borne in a flower. Each stamen consists of a filament and an anther. The anther produces pollen grains male gametophyte after meiosis. The pistil consists of an ovary enclosing one to many ovules. Within the ovule is the female gametophyte or embryo sac which contains the egg cell. The pollen tube enters the embryo-sac where two male gametes are discharged. One male gamete fuses with egg cell syngamy and other fuses with diploid secondary nucleus triple fusion. This phenomenon of two fusions is called double fertilisation and is unique to angiosperms. The angiosperms are divided into two classes â€” the dicotyledons and the monocotyledons. During the life cycle of any sexually reproducing plant, there is alternation of generations between gamete producing haploid gametophyte and spore producing diploid sporophyte. However, different plant groups as well as individuals may show different patterns of life cycles â€” haplontic, diplontic or intermediate.

Chapter 3 : Plants with Seeds - Gymnosperms and Angiosperms | PMF IAS

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Generally bisexual and rarely unisexual. Cones are generally unisexual and rarely bisexual. Structural differences Sepals and petals are not been possessed. Sporophyll bears short thalamus. Sporophyll bears elongated central axis. Megasporophyll is structured to form a carpel. It is the woody part. Stigma and Style present. Microsporophyll is represented by a stamen, consisting of stamen and filament. Microsporophyll is represented by a broad, sterile head. No distinction in anther and filament. Ovules are present inside the ovary part of the carpel; these are attached to the placenta. Ovules lie on the megasporophyll and are not borne on the placenta. Ovules are produced on a stalk or funiculus. An ovule is covered by one or two thin integuments of narrow micropyle. An ovule is covered by three layers of integuments of wide micropyle. Usually four microsporangia or pollen sacs. Varies from two Pinus to several hundred in Cycas. The female gametophyte contains seven-celled and eight nucleate embryo sac. The female gametophyte is parenchymatous and large. Archegonia are absent Distinct archegonia is present. Tube cell and a generative cell is present in male gametophyte, which divides and form two male gametes. One or two prothalial cell, stalk cell, tube cell and a body cell, which further divides into two male gametes. The embryo contains one or two cotyledons. Embryo contains one or many cotyledons. Type of fertilization Double fertilization process is there, where both the male gametes are in active state and one play the role for generative fertilization and other for vegetative fertilization or triple fusion. There is only one generative type of fertilization and only one gamete is functional. Development of seeds It develops inside the ovary part of the carpel which matures into a fruit. Seeds develop on the megasporophyll and fruits are never formed. Flowering plants are economically important as they serve as a source of pharmaceuticals, timber, ornamental, fiber products, and other commercial uses. Gymnosperms are known for providing softwoods such as pine, fir and use to make paper, the lumber, and plywood. There are more than 25, species found till the date of the angiosperms. Angiosperms are considered to be having more variety of species which include the trees, herbs, and shrubs. These have a proper root system, which helps in gathering water and minerals from the soil. Stems in these types work for the transportation system of the body, and the leaves are considered as the main source for the intake of food. As well they have their pollen receptive structure. Endosperm is produced as a triploid tissue primarily as it is created during triple fusion. Angiosperms represent 80 percent of all the known green plants. They are the vascular seeds plants where ovule egg is fertilized and develops into a seed in an enclosed ovary. The ovary is enclosed within the flower, this part contains male or female or both kind of reproductive organ. In these types, fruits get derived, after the maturity of the floral organs of the plant. There are around of species found of this type. The gymnosperms are green all throughout the year and stay alive for a long duration. They also have roots and stem, which helps in the anchoring and in absorbing water and minerals from the soil and stems helps in transporting the materials, but they do not contain ovary and the stigma which is present on angiosperms. Gymnosperms are mostly limited to woody trees. They have needle-like leaves which reduce water loss. These are common to the lumber industry, trees of these woods are used much. In Gymnosperms seeds are enclosed in cones where male cones produce pollen, while female cones produce eggs. Here the male is called as pollen cone and female is called seed cone. Cones protects the seeds where zygote gets hardens itself. Cedar, Pine, Redwood, Evergreen. Gymnosperms can be divided into three more categories like Cycads, Ginkgo, and Conifers. Pollen cones release pollen male gametophyte which is the haploid stage because double fertilization and triple fusion are absent in this class. The endosperm is produced before fertilization. Key Differences Between Angiosperms and Gymnosperms Following are the substantial key differences between angiosperms and gymnosperms: Angiosperms consist flowering ornamentals, fruits, and all vegetables and hence called as flowering plants, while gymnosperms contain all kind of pine, fir, pine, conifers, cedar, juniper, cypress and hence called as non-flowering plants. Angiosperms contain sporophylls which get accumulated to produce flowers, angiosperms are generally bisexual and rarely unisexual, whereas

gymnosperms also contain sporophylls which get accumulated to form cones. Structural differences Sepals and petals present in angiosperms, which are not been possessed by gymnosperms. Sporophyll bears short thalamus in angiosperms; it sporophyll bears elongated central axis gymnosperms. In angiosperms stigma and style are present and usually, four microsporangia or pollen sacs are present. In gymnosperms stigma and style are absent and microsporangia vary from two Pinus to several hundred in Cycas. Ovules are present inside the ovary part of the carpel; these are attached to the placenta, these ovules are produced on a stalk or funiculus in angiosperms. While in gymnosperms ovules lie on the megasporophyll and are not borne on the placenta and they ovules are sessile. An ovule is covered by one or two thin integuments of narrow micropyle in angiosperms; whereas in gymnosperms an ovule is covered by three layers of integuments of wide micropyle. Angiosperms, the female gametophyte contains seven-celled and eight nucleate embryo sac whereas in gymnosperms the female gametophyte is parenchymatous and large. Archegonia are absent and Tube cell and a generative cell is present in male gametophyte, which divides and form two male gametes in angiosperms; Distinct archegonia are present and one or two prothalial cell, stalk cell, tube cell and a body cell, which further divides into two male gametes in gymnosperms. In angiosperms, embryo contains one or two cotyledons and the seeds develop inside the ovary part of the carpel which matures into a fruit. In gymnosperms embryo contains one or many cotyledons, even the seeds develop on the megasporophyll and fruits are never formed. Double fertilization process is there, where both the male gametes are in active state and one play the role for generative fertilization and other for vegetative fertilization or triple fusion in angiosperms; while in gymnosperms there is only one generative type of fertilization and only one gamete is functional. Flowering plants are economically important as they serve as a source of pharmaceuticals, timber, ornamentals, fiber products, and other commercial uses, whereas gymnosperms are known for providing softwoods such as pine, fir and use to make paper, lumber, and plywood. Conclusion Here we can conclude that the kingdom Plantae, which is also called metaphyta includes all kinds photosynthetic, multicellular and eukaryotic plants found in the biosphere. In this kingdom, most of them are autotrophs, while some are autotrophs as well as heterotrophs. Angiosperms and gymnosperms being the groups of the plant kingdoms are important as they occupy more than 80 percent of the whole kingdom. But in terms of vegetations, the angiosperms dominates the earth surface specifically terrestrial habitat than any other group. But it suffices to say that life on earth and success of many organisms depends on the success of plants, either directly or indirectly. You Might Also Like:

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Chapter 4 : Difference Between Angiosperms and Gymnosperms (with Comparison Chart) - Bio Difference

Bryophytes, Pteridophytes and Gymnosperms. Article Shared by. ADVERTISEMENTS: Learn about the comparison among bryophytes, pteridophytes and gymnosperms.

They have natural ability to produce seeds surrounded by nutritive tissue and coated with a seed coat. Gymnosperm plants were present million years before the angiosperm plants. The main difference between angiosperms and gymnosperms is the diversity. The diversity of angiosperm is greater than the gymnosperm. The higher diversity indicated the angiosperms are adaptive to terrestrial ecosystems. Another characteristic of angiosperms is the flowers and production of fruits. But, in gymnosperms seed are not included in a fruit. Angiosperm The word angiosperm derived from Greek meaning container. As the name suggests the angiosperms is a plant which bears seeds in fruits or mature ovaries. Angiosperm forms flower that carries reproductive organs and fruits. These plants are more adaptive to the terrestrial ecosystem and can be found widespread on earth, around species have been identified of this class. Plants with nightshade family like Petunias, Eggplant, Tomato, Peppers. While, in grass family wheat, corn, rice, and sugarcane. Gymnosperms Gymnosperms are other types of plant that bear seeds directly on sporophylls or naked seeds without covering. There are very fewer species of gymnosperms, few examples of are cypress, Gnetum, pine, spruce, redwood, ginkgo, cycads, juniper, fir, and Welwitschia. The main reason for being very fewer species is the lack of protection of seeds. The seeds are naked and unprotected when released. They need to get into the ground quickly to take root or they will be damaged by animals or weather conditions. Difference Between Angiosperm and Gymnosperm Angiosperm Seed is produced by flowering plants and is enclosed within ovary Seed is produced by non-flowering plants and are unenclosed or naked. The lifecycle of these plants are seasonal These plants are evergreen.

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Chapter 5 : Angiosperms and Gymnosperms

Gymnosperms vs Pteridophytes Similarities There is a regular heterotrophic alternation of generations Sporophyte is the predominant plant body and is differentiated into root, stem and leaves Some pteridophytes and some gymnosperms exhibit air cinate vernation in young leaves.

Check new design of our homepage! Angiosperms and Gymnosperms Angiosperms and gymnosperms are classifications of plants that have different characteristic properties. Their distinct features form the basis of their classification. Read on to know the details. BiologyWise Staff Angiosperms are commonly known as flowering plants that can be clearly distinguished from gymnosperms by certain "derived" characteristics. In botany, these characteristics are specifically termed as synapomorphies. Gymnosperms are known as the ancestors of flowering plants that were known to exist million years ago. With the passing ages, flowering plants evolved with modifications in various organs, like flowers, leaves, stems, endosperm, etc. Similarities The seed bearing plants are broadly divided into a single class known as Spermatophyta, which is further sub-divided into angiosperms and gymnosperms. The word gymnosperm is derived from Greek word gymnospermos, meaning "naked seed". Both these are types of plants bear seeds. Although the differences between these two types are more distinct, the points mentioned below are some of the similarities between them. They are capable of producing pollen for fertilization, which is siphonogamous, i. Gymnosperms mostly depend on wind pollination, and some angiosperms are also dependent on the same agent. The sporophyte of both these varieties is differentiated into root, stem, and leaves. Apart from primary growth, their stem also undergoes expansion by secondary growth. Like angiosperms, gymnosperms also have vessels and companion cells. The vascular system is common for the both of them, consisting of conjoint and vascular bundles open and collateral. The ovules of both angiosperms and gymnosperms develop into seeds. Their mode of seed germination is epigeal, hypogeal, or both. One distinct similarity is the reduced gametophytic phase of both plants. Polyembryony, a common feature of gymnosperms, is also prevalent in some angiosperms and a suspensor is formed during the embryo development phase. Differences The main difference between angiosperms and gymnosperms is the type of seeds. The seeds of the former are enclosed within a fruit, while the latter have naked seeds. Gymnosperm is classified into four divisions, namely: Coniferophyta Ginkgophyta Gnetophyta According to botanists, Angiosperms form a single coherent group known as Angiophyta. As already stated above, their classification is based on differences in various structures and the mode of fertilization, therefore they are a much more differentiated plant species. The differences between the two types are mentioned below. Angiosperms are of a much more varied type than gymnosperms. They can be trees, herbs, and shrubs, while gymnosperms are mostly woody trees. The typical structure of flowering plants consisting of ovary, style, and stigma is absent in gymnosperms, is an important aspect of angiosperms. Angiosperms have companion cells and xylem vessels in them, but these features are only present in Gnetales, a particular class of gymnosperms. Gymnosperms have unisexual flowers, while the other group bear flowers that are mostly bisexual. This is because double fertilization and triple fusion are absent in the former category, as a result the endosperm is formed before fertilization; while in the latter, the endosperm is the product of a triple fusion. Occurrence of a free nuclear division is present in angiosperm, but is absent in the other type. Female gametophyte, known as archegonia, is clearly distinct in gymnosperms, whereas it is absent in angiosperms. In angiosperms, the pollen receptive structures are mostly ovules, so they do not have to depend on external agents for pollination; while gymnosperms rely on natural agents. From a comparative study of angiosperms vs. Here are a few examples based on their classification. The list of examples for angiosperms is indeed huge, as it includes all the flowering plants irrespective of them being monocotyledonous or dicotyledonous.

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Chapter 6 : Bryophytes, Pteridophytes and Gymnosperms

Bryophytes vs Pteridophytes vs Gymnosperms Definition Bryophytes Bryophytes are the most preliminary type of plants which includes mosses and liverworts.

Not by how their life cycle progresses but by their general appearance. This group of plants is rather more technical but it is very surprising to know that they are just one of those familiar tree plants and shrubs that you happen to see around. Ferns are plants that do not bear flowers. They do not have any seeds as well. In this regard, their mode of reproduction is through spores. Gymnosperms on the other hand have seeds, although they are not put inside an ovary. Hence, they procreate using those seeds. Examples of such are the conifers and cycads. In terms of family classification, ferns are grouped within the division Pteridophyta whereas gymnosperms have four divisions namely: Pinophyta conifers , Ginkgophyta, Gnetophyta and Cycadophyta. The first division is regarded as the biggest of them all that specifically includes pines trees. Moreover, it has been noted that ferns are the bigger group of plants that is comprised of almost 20, different species whereas gymnosperms only have less than 1, There are to species of gymnosperms to be more exact. In more detail, the life cycles of ferns and gymnosperms really differ. The latter grows further through mitotic division to form gametophytes. These gametophytes create gametes usually sperms and eggs altogether. The more motile sperm will then look for an egg to fertilize while still being affixed to the prothallus. Gymnosperms are also termed as sporophytes that create spores. Their mode of reproduction slightly varies depending on the division to which the gymnosperm belongs. For example, cycads have more mobile sperms that can go immediately towards the egg in the ovule by swimming. Also, there is a difference in the gametophytic life cycle stages between ferns and gymnosperms wherein ferns have complex liberally surviving gametophytes unlike gymnosperms. Ferns are flowerless plants that do not have any seeds whereas gymnosperms do have seeds of their own. Ferns are grouped in one division whereas gymnosperms have four different divisions. Ferns have a bigger number of species compared to gymnosperms. If you like this article or our site. Please spread the word.

Chapter 7 : Difference between Gymnosperms and Pteridophytes | Plants

Bryophyte versus Pteridophyte comparison chart; Bryophyte Pteridophyte; Introduction (from Wikipedia) Bryophyte is a traditional name used to refer to all embryophytes that do not have true vascular tissue and are therefore called "non-vascular plants".

Chapter 8 : Difference Between Gymnosperms and Ferns | Difference Between

Unlike bryophytes and pteridophytes {Bryophytes - Pteridophytes}, in gymnosperms the male and the female gametophytes do not have an independent free-living existence. They remain within the sporangia retained on the sporophytes.

Chapter 9 : Difference between Angiosperms and Pteridophytes - MD

Some pteridophytes like Selaginella is heterosporous but there is no seed formation. 8. In angiosperms, stamens and carpels are the male and female reproductive structures which are organized to form the flower.