#424335

Topic: Tissue

Mention the ploidy of the following:

1. Protonemal cell of a moss,

2. Primary endosperm nucleus in dicot,

3. Leaf cell of a moss,

4. Prothallus cell of a fern,

5. Gemma cell in *Marchantia*,

6. Meristem cell of a monocot,

7. Ovum of a liverwort,

8. Zygote of a fern.

Solution

(a) Protonemal cell of a moss – Haploid

(b) Primary endosperm nucleus in a dicot – Triploid

(c) Leaf cell of a moss – Haploid

(d) Prothallus of a fern – Haploid

(e) Gemma cell in *Marchantia* – Haploid

(f) Meristem cell of a monocot – Diploid

(g) Ovum of a liverwort – Haploid

(h) Zygote of a fern – Diploid

#424370

Topic: Leaf

How is a pinnately compound leaf different from a palmately compound leaf?

Solution

Pinnately compound leaf: The leaflets are attached to the common axis, called as rachis.

Examples include neem and *Cassia fistula* (also called as golden shower plant).

Palmately compound leaf: The leaflets are attached at a common point on the leaf stalk.

Examples include silk cotton (*Bombax*) and *Cannabis*.

#424371

Topic: Leaf

Explain with suitable examples, the different types of phyllotaxy.

Solution

Phyllotaxy refers to the pattern or arrangement of leaves on the stem or branch of a plant. It is of three types: alternate, opposite and whorled phyllotaxy.

In alternate phyllotaxy, a single leaf arises from the node of a branch. This type of phyllotaxy is observed in the sunflower, mustard and peepal. Plants with opposite phyllotaxy have two leaves arising from the node in opposite directions. It is found in guava and jamun plants. Plants with whorled phyllotaxy have three or more leaves arising from the node. It is found in *Alstonia*.

#424372

Topic: Flower

Define the following terms:

(a) Aestivation

(b) Placentation

(c) Actinomorphic

(d) Zygomorphic

(e) Superior ovary

(f) Perigynous flower

(g) Epipetalous stamen

Solution

(a) Aestivation:

The term ‘aestivation’ refers to the mode in which sepals or petals are arranged in a floral bud with respect to other floral members. There are four types of aestivation in plants, i.e., valvate, twisted, imbricate, and vexillary.

(b) Placentation:

The term ‘placentation’ refers to the arrangement of ovules within the ovary of a flower. It is primarily of five types, namely marginal, basal, parietal, axile and free central.

(c) Actinomorphic:

Actinomorphic flowers can be divided into two radial halves by any radial plane passing through its centre. Examples of these flowers include chilly and mustard.

(d) Zygomorphic:

Zygomorphic flowers are those flowers which can be divided into two similar halves by a single vertical plane. Examples of these flowers include pea and beans.

(e) Superior ovary:

Superior ovary flowers are those flowers in which the gynoecium is present at the highest position, while other floral parts are arranged below it. A flower with this arrangement is described as hypogynous. Examples include brinjal and mustard.

(f) Perigynous flower:

In perigynous flowers, the gynoecium is present in the centre and the rest of the floral parts are arranged at the rim of the thalamus at the same level. Examples include plum and rose.

(g) Epipetalous stamen:

Epipetalous stamens are stamens attached to the petals. They are found in brinjal.

#424373

Topic: Inflorescence

Differentiate between

(a) Racemose and cymose inflorescence

(b) Fibrous root and adventitious root

(c) Apocarpous and syncarpous ovary

Solution

(a)

Racemose inflorescence	Cymose inflorescence
Younger flowers are present at the tip while older flowers are arranged at the base of this inflorescence. Such an arrangement is called acropetal succession.	Younger flowers are present at the base of the inflorescence, while older flowers are present at the top. Such an arrangement is called basipetal succession.
The main axis in racemose inflorescence continues to grow and produce flowers laterally.	The main axis in cymose inflorescence has limited growth, which later terminates into a flower.

(b)

Fibrous root	Adventitious root
In monocots, the primary root which develops from the radicle of the seed is short-lived and is replaced by a large number of roots arising from the base of the stem.	These roots arise from any part of the plant other than the radicle of seeds.
It is found in wheat and other cereals.	It is found in banyan, *Monstera*, and other plants.

(c)

Apocarpous ovary	Syncarpous ovary
The flowers with apocarpous ovary have more than one carpel. These carpels are free.	The flowers with syncarpous ovary have more than one carpel. However, these carpels are fused
It is found in lotus and rose flowers.	It is found in the flowers of tomato and mustard.

#424374

Topic: Fruit and seed

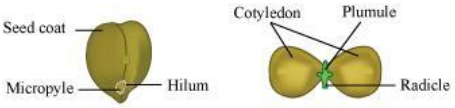
Draw the labelled diagram of the following:

(i) Gram seed

(ii) V. S. of maize seed

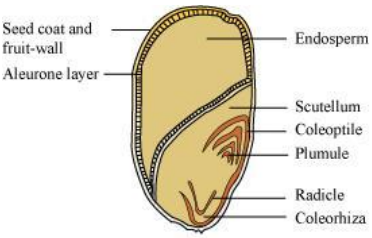
Solution

(i) Gram seed



Structure of Gram seed

(ii) V.S. of maize seed



V.S. of maize seed

#424375

Topic: Stem

Describe modifications of stem with suitable examples.

Solution

Stems of various plants have undergone modifications to perform different functions.

1. Underground stems or storage stems:

Examples: Rhizomes, Corms, tubers

In ginger and banana, the underground stem is called as a rhizome. The underground stem in *Colocasia* (arvi) is known as corm. Rhizomes and corms are underground stems, modified for the storage of food. Also, these stems help in vegetative reproduction of these plants. The tips of the underground stem in potato plants become swollen due to the accumulation of food. The potato is a tuber that helps in the storage of food and bears eyes on it. Subtended by a leaf scar, these eyes bear buds that give rise to new plants.

2. Supportive stems:

Example: tendril

The stem in some weak plants bears thin, slender and spirally-coiled structures called as tendrils that help the plant get attached to nearby structures for support. Tendrils are found in cucumbers, melons and other members of the family Cucurbitaceae.

3. Protective stems:

Example: Thorns

The stem in *Bougainvillea* and citrus plants (like lemon and orange) bear sharp, pointed structures called as thorns, which provide protection to the plant from herbivores.

4. Photosynthetic stems:

Example: *Opuntia*

The stem in the *Opuntia* is green. It carries out the process of photosynthesis in the absence of leaves.

5. Others stem modifications:

In some plants, underground stems such as grasses spread in the soil and help in perenation. These stems are called as runners.

The short lateral stem called as the offset in some aquatic plants (such as *Eichhornia*) bears leaves and tufts of roots at the node and gives rise to new plants.

#424376

Topic: Taxonomy of angiosperm

Take one flower each of the families Fabaceae and Solanaceae and write its semi-technical description. Also draw their floral diagram after studying them.

Solution

(1) Family Fabaceae/Papilionaceae (pea plant) :

Fabaceae/Papilionaceae is a sub-family of the Leguminoseae family.

Vegetative features :

Habit : Pinnately compound, alternately arranged with leaf tendrils with the pulvinus present at the leaf base along folacious stipules.

Root : Tap root system with root nodules.

Floral features :

Inflorescence : Racemose, generally axial than terminal

Flower : Zygomorphic and bisexual flowers are found.

Calyx : It contains five sepals which are gamosepalous while aestivation is imbricate.

Corolla : It contains five petals (polypetalous) with vexillary aestivation.

Androecium : It consists of ten anthers that are diadelphous with dithecous anthers.

Gynoecium : Monocarpellary superior ovary which is unilocular with marginal placentation.

Fruit : Legume pod with non-endospermic seeds.

Economic importance: Peas are used as vegetables for making various culinary preparations.

(2) Flowers of *Solanum nigrum*

Vegetative features :

Habit : Erect, herbaceous plant

Leaves : Simple, exstipulate leaves with reticulate venation

Stem : Erect stem with numerous branches.

Floral features :

Inflorescence : Solitary and axillary

Flowers : Actinomorphic, bisexual flowers

Calyx : Calyx is composed of five sepals that are united and persistent. Aestivation is valvate.

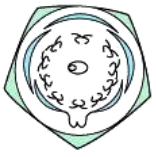
Corolla : Corolla consists of five united petals with valvate aestivation.

Androecium : It consists of five epipetalous stamens.

Gynoecium : It consists of bicarpellary syncarpous superior ovary with axile placentation.

Fruits : Berry Seeds: Numerous, endospermous

Economic importance : Used for medicinal purposes.



Floral diagram of family Papilionaceae

Floral diagram of family Solanaceae

#424377

Topic: Flower

Describe the various types of placentations found in flowering plants.

Solution

Placentation refers to the arrangement of ovules inside the ovary. It is of five basic types:

(A) Marginal placentation-

The ovary in which the placenta forms a ridge along the ventral suture of the ovary and the ovules develop on two separate rows is known to have marginal placentation. This type of placentation is found in peas.

(B) Parietal placentation-

When the ovules develop on the inner walls of the ovary, the ovary is said to have parietal placentation.

C) Axile placentation-

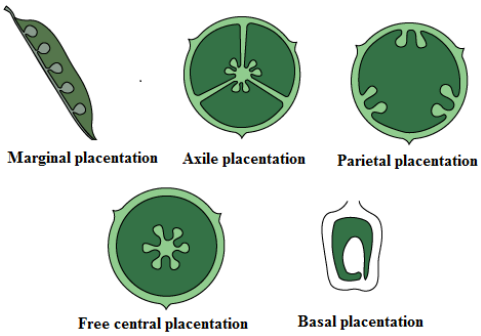
In axile placentation, the placenta is axial and ovules are attached to it. Examples include China rose, lemon and tomato.

(D) Basal placentation-

The ovary in which the placenta develops from its base and a single ovule is found attached to the base is said to have basal placentation. It is found in marigold and sunflower.

(E) Free central placentation-

In free central placentation, the ovules develop on the central axis while the septa are absent. This type of placentation is found in *Dianthus* and primrose.



#424378

Topic: Flower

What is a flower? Describe the parts of a typical angiosperm flower.

Solution

A flower can be defined as the reproductive unit of any flowering plant (angiosperms). Flowers carry out sexual reproduction in angiosperms. A typical flower is a modified stem with a condensed axis. A flower has four different parts, i.e., the calyx, corolla, androecium and gynoecium. Androecium and gynoecium represent the male and female reproductive organs of a flower (respectively). Bisexual flowers are those which contain both androecium and gynoecium, while unisexual flowers contain either gynoecium or androecium. The corolla and the calyx are generally distinct, but may sometimes be fused (called as perianth). A flower that contains all four floral parts is called as a complete flower.

Parts of flowers:

(A) The calyx forms the outermost whorl of a flower, which contains sepals. They are green, leaf–like structures that cover and protect the flowers during the bud stage. When the sepals of a flower are free, they are called as polysepalous, while fused sepals of a flower are called as gamosepalous.

(B) The corolla of a flower is a layer that lies inside the calyx. It contains beautifully coloured petals, which help in attracting insects for pollination. When the petals are free, they are called as polypetalous, while fused petals are called as gamopetalous.

(C) The androecium or the stamen is the male reproductive part of a flower. It consists of two parts, the filament and the bilobed anther. The bilobed anther is the site for meiosis and the generation of pollen grains.

(D) Gynoecium represents the female reproductive part of a flower. It consists of an ovary. The ovary is connected by a long tube (called as style) to the stigma. The ovary bears numerous ovules attached to the placenta.

#424379

Topic: Leaf

How do the various leaf modifications help plants?

Solution

The main function of the leaves is to carry out the process of photosynthesis. However, in a few plants, leaves are modified to perform different functions.

(a) Tendrils: The leaves of a pea plant are modified into tendrils that help the plant in climbing.

(b) Spines: The leaves in cactus are modified into sharp spines that act as an organ of defence.

(c) Phyllode: The leaves of some Australian acacia are short-lived and soon replaced by flattened, green structures called as phyllodes that arise from the petiole of the leaves. The petioles in these plants synthesize food.

(d) Pitcher: The leaves of the pitcher plant are modified into pitcher-like structures, which contain digestive juices and help in trapping and digesting insects.

#424380

Topic: Inflorescence

Define the term inflorescence. Explain the basis for the different types of inflorescence in flowering plants.

Solution

The inflorescence is the manner in which the flowers are arranged on the flowering axis. During the flowering season, the vegetative apex of the stem gets converted into a floral meristem. Based on whether the floral axis continues to grow or end in a flower, the inflorescence is classified into racemose and cymose. In racemose inflorescence, the floral axis continues to grow and produces flowers laterally. On the other hand, in cymose inflorescence, the main axis terminates into a flower. Hence, it is limited in growth.

#424381

Topic: Taxonomy of angiosperm

Write the floral formula of a actinomorphic, bisexual, hypogynous flower with five united sepals, five free petals, five free stamens and two united carpels with superior ovary and axile placentation.

Solution

The floral formula of the described flower is represented as:

$\oplus\ \varphi\ K_{(5)}\ C_5\ A_5\ \underline{G}_{(2)}$

Actinomorphic flowers are represented by the symbol

$\oplus$

A bisexual flower is indicated by

φ

The calyx contains five united sepals which can be represented as K5.

The corolla consists of five free petals and it represented as C5.

The androecium consists of five free stamens and is represented by A5.

The gynoecium consists of a superior ovary with two united carpels and axile placentations, which can be represented as $\underline{G}_{(2)}$.

#424382

Topic: Flower

Describe the arrangement of floral members in relation to their insertion on thalamus.

Solution

Based on the position of the calyx, corolla, and androecium (with respect to the ovary on the thalamus), the flowers are described as hypogynous, perigynous, and epigynous.

In hypogynous flowers, the ovary occupies the highest position on the thalamus while other floral parts are situated below it. In such flowers, the ovary is superior, e.g., China rose, mustard etc.

In perigynous flowers, the ovary is situated at the centre and other floral parts are arranged on the rim of the thalamus. The ovary here is said to be half inferior, e.g., plum, rose, peach.

In epigynous flowers, the thalamus grows around the ovary fusing with its wall. The other floral parts are present above the ovary. Hence, the ovary is said to be inferior, e.g., flowers of guava and cucumber.

#424383

Topic: Tissue

State the location and function of different types of meristems.

Solution

Meristems are specialised regions of plant growth. The meristems mark the regions where active cell division and rapid division of cells take place. Meristems are of three types depending on their location.

Apical meristem:

It is present at the root apex and the shoot apex. The shoot apical meristem is present at the tip of the shoots and its active division results in the elongation of the stem and formation of new leaves. The root apical meristem helps in root elongation.

Intercalary meristem:

It is present between the masses of mature tissues present at the bases of the leaves of grasses. It helps in the regeneration of grasses after they have been grazed by herbivores. Since the intercalary meristem and the apical meristem appear early in a plant's life, they constitute the primary meristem.

Lateral meristem:

It appears in the mature tissues of roots and shoots. It is called as the secondary meristem as it appears later in a plant's life. It helps in adding secondary tissues to the plant body and in increasing the girth of plants. Examples include fascicular cambium, interfascicular cambium, and cork cambium.

#424384

Topic: Secondary growth

Cork cambium forms tissues that form the cork. Do you agree with this statement? Explain.

Solution

When secondary growth occurs in the dicot stem and root, the epidermal layer gets broken. There is a need to replace the outer epidermal cells for providing protection to the stem and root from infections. Therefore, the cork cambium develops from the cortical region. It is also known as phellogen and is composed of thin-walled rectangular cells. It cuts off cells toward both sides. The cells on the outer side get differentiated into the cork or phellem, while the cells on the inside give rise to the secondary cortex or phelloderm. The cork is impervious to water but allows gaseous exchange through the lenticels. Phellogen, phellem, and phelloderm together constitute the periderm.

#424385

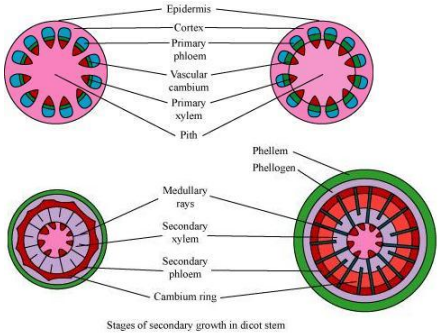
Topic: Secondary growth

Explain the process of secondary growth in the stems of woody angiosperms with the help of schematic diagrams. What is its significance?

Solution

In woody dicots, the strip of cambium present between the primary xylem and phloem is called the interfascicular cambium. The interfascicular cambium is formed from the cells of the medullary rays adjoining the interfascicular cambium. This results in the formation of a continuous cambium ring. The cambium cuts off new cells toward its either sides. The cells present toward the outside differentiate into the secondary phloem, while the cells cut off toward the pith give rise to the secondary xylem. The amount of the secondary xylem produced is more than that of the secondary phloem.

The secondary growth in plants increases the girth of plants, increases the amount of water and nutrients to support the growing number of leaves, and also provides support to plants.



Stages of secondary growth in dicot stem

#424386

Topic: Anatomy of dicot and monocot

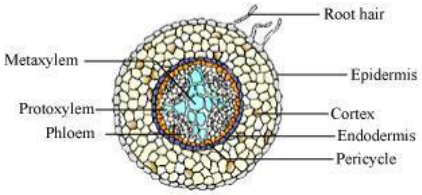
Draw illustrations to bring out the anatomical difference between

(a) Monocot root and dicot root

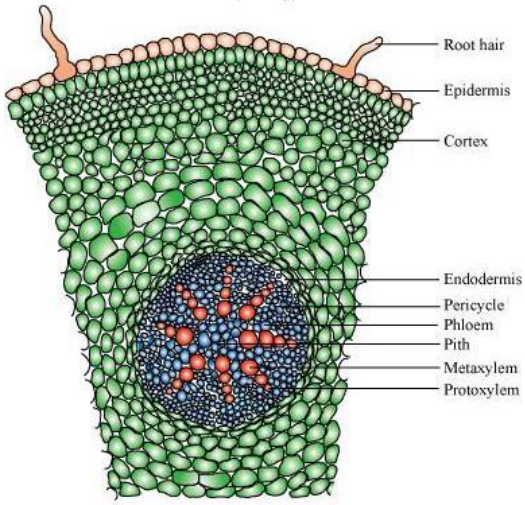
(b) Monocot stem and dicot stem

Solution

(a)Monocot root and dicot root

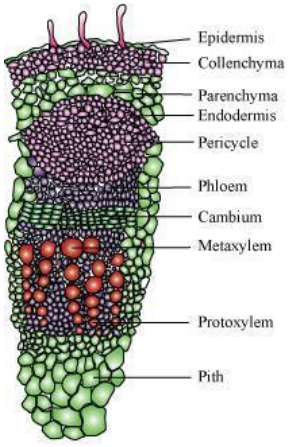


T.S. of dicot root (Primary)

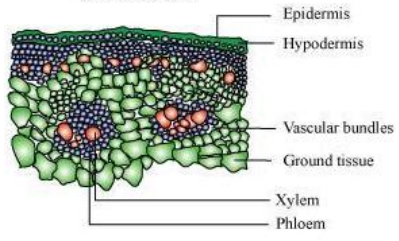


T.S. of monocot root

(b)Monocot stem and dicot stem



T.S. of dicot stem



T.S. of monocot stem

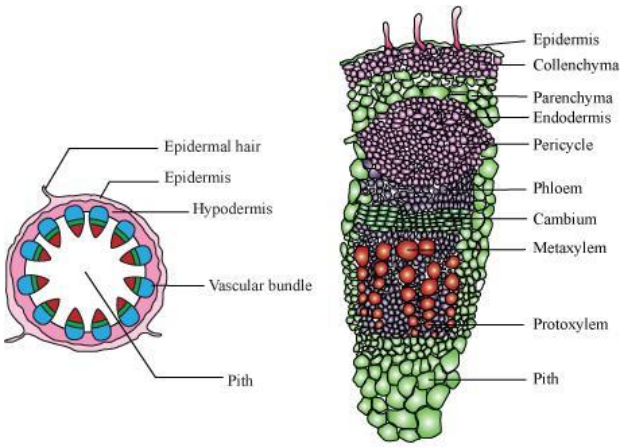
#424387

Topic: Anatomy of dicot and monocot

Cut a transverse section of young stem of a plant from your school garden and observe it under the microscope. How would you ascertain whether it is a monocot stem or a dicot stem? Give reasons.

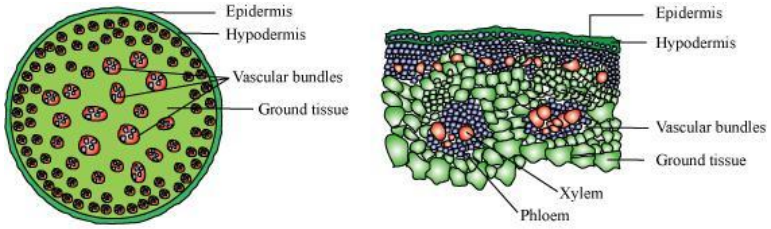
Solution

The dicot stem is characterised by the presence of conjoint, collateral and open vascular bundles, with a strip of cambium between the xylem and phloem. The vascular bundles are arranged in the form of a ring, around the centrally-located pith. The ground tissue is differentiated into the collenchyma, parenchyma, endodermis, pericycle and pith. Medullary rays are present between the vascular bundles.



T.S. of dicot stem

The monocot stem is characterised by conjoint, collateral and closed vascular bundles, scattered in the ground tissue containing the parenchyma. Each vascular bundle is surrounded by sclerenchymatous bundle-sheath cells. Phloem parenchyma is absent and water-containing cavities are present.



T.S. of monocot stem

#424388

Topic: Tissue

The transverse section of a plant material shows the following anatomical features:

(a) The vascular bundles are conjoint, scattered and surrounded by a sclerenchymatous bundle sheaths.

(b) Phloem parenchyma is absent.

What will you identify it as?

Solution

The monocot stem is characterised by conjoint, collateral, and closed vascular bundles, scattered in the ground tissue containing the parenchyma. Each vascular bundle is surrounded by sclerenchymatous bundle-sheath cells. Phloem parenchyma and medullary rays are absent in monocot stems.

#424389

Topic: Tissue

Why are xylem and phloem called as complex tissues?

Solution

Xylem and phloem are known as complex tissues as they are made up of more than one type of cells. These cells work in a coordinated manner, as a unit, to perform the various functions of the xylem and phloem.

Xylem helps in conducting water and minerals. It also provides mechanical support to plants. It is made up of the following components:

• Tracheids (xylem vessels and xylem tracheids)

• Xylem parenchyma

• Xylem fibres

Tracheids are elongated, thick-walled dead cells with tapering ends. Vessels are long, tubular, and cylindrical structures formed from the vessel members, with each having lignified walls and large central cavities. Both, tracheids and vessels lack protoplasm. Xylem fibres consist of thick walls with an almost insignificant lumen. They help in providing mechanical support to the plant. Xylem parenchyma is made up of thin-walled parenchymatous cells that help in the storage of food materials and in the radial conduction of water.

Phloem helps in conducting food materials. It is composed of:

• Sieve tube elements

• Companion cells

• Phloem parenchyma

• Phloem fibres

Sieve tube elements are tube-like elongated structures associated with companion cells. The end walls of sieve tube elements are perforated to form the sieve plate. Sieve tube elements are living cells containing cytoplasm and nucleus. Companion cells are parenchymatous in nature. They help in maintaining the pressure gradient in the sieve tube elements. Phloem parenchyma helps in the storage of food and is made up of long tapering cells, with a dense cytoplasm. Phloem fibres are made up of elongated sclerenchymatous cells with thick cell walls.

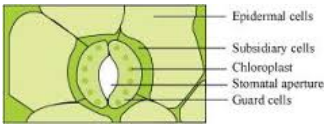
#424390

Topic: Tissue system

What is stomatal apparatus? Explain the structure of stomata with a labelled diagram?

Solution

Stomata are small pores present in the epidermis of leaves. They regulate the process of transpiration and gaseous exchange. The stomatal pore is enclosed between two bean-shaped guard cells. The inner walls of guard cells are thick, while the outer walls are thin. The guard cells are surrounded by subsidiary cells. These are the specialised epidermal cells present around the guard cells. The pores, the guard cells, and the subsidiary cells together constitute the stomatal apparatus.



#424391

Topic: Tissue system

Name the three basic tissue systems in the flowering plants. Give the tissue names under each system.

Solution

Sr. No	Tissue system	Tissues present
1	Epidermal tissue system	Epidermis, trichomes, hairs, stomata
2	Ground tissue system	Parenchyma, collenchyma, sclerenchyma, mesophyll
3	Vascular tissue system	Xylem, phloem, cambium

#424393

Topic: Anatomy of dicot and monocot

What is a periderm? How does periderm formation take place in the dicot stems?

Solution

Periderm is composed of the phellogen, phellem and phelloderm.

During secondary growth, the outer epidermal layer and the cortical layer are broken because of the cambium. To replace them, the cells of the cortex turn meristematic, giving rise to cork cambium or phellogen. It is composed of thin-walled, narrow and rectangular cells.

Phellogen cuts off cells on its either side. The cells cut off toward the outside give rise to the phellem or cork. The suberin deposits in its cell wall make it impervious to water.

The inner cells give rise to the secondary cortex or phelloderm. The secondary cortex is parenchymatous.

#424394

Topic: Anatomy of dicot and monocot

Describe the internal structure of a dorsi-ventral leaf with the help of labelled diagram.

Solution

Dorsiventral leaves are found in dicots. The vertical section of a dorsiventral leaf contains three distinct parts:

[1] Epidermis:

Epidermis is present on both the upper surface (adaxial epidermis) and the lower surface (abaxial epidermis). The epidermis on the outside is covered with a thick cuticle.

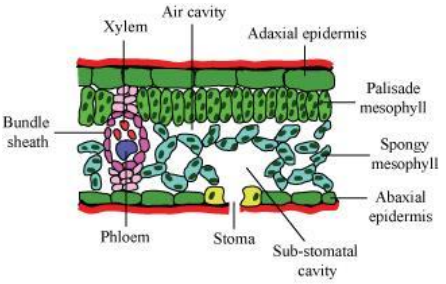
Abaxial epidermis bears more stomata than the adaxial epidermis.

[2] Mesophyll:

Mesophyll is a tissue of the leaf present between the adaxial and abaxial epidermises. It is differentiated into the palisade parenchyma (composed of tall, compactly-placed cells) and the spongy parenchyma (comprising oval or round, loosely-arranged cells with intercellular spaces). Mesophyll contains the chloroplasts which perform the function of photosynthesis.

[3] Vascular system:

The vascular bundles present in leaves are conjoint and closed. They are surrounded by thick layers of bundle-sheath cells.



T. S. of dicot leaf

#424898

Topic: Tissue

Explain why xylem transport is unidirectional and phloem transport bi-directional?

Solution

During the growth of a plant, its leaves act as the source of food as they carry out photosynthesis. The phloem conducts the food from the source to the sink (the part of the plant requiring or storing food). During spring, this process is reversed as the food stored in the sink is mobilised toward the growing buds of the plant, through the phloem. Thus, the movement of food in the phloem is bidirectional (i.e., upward and downward).

The transport of water in the xylem takes place only from the roots to the leaves. Therefore, the movement of water and nutrients in the xylem is unidirectional.

#464533

Topic: Tissue

Define the term "tissue".

Solution

Tissue is a group of similar cells that perform same function and share common origin.

#464534

Topic: Tissue

How many types of elements together make up the xylem tissue? Name them.

Solution

Xylem is a conducting tissue which mainly helps in the conduction of water and minerals from the roots to other parts of the plant. It is composed of four components. They are:

1. Tracheids

2. Vessels

3. Xylem parenchyma

4. Xylem fibres

#464535

Topic: Tissue

How are simple tissues different from complex tissues in plants?

Solution

A simple tissue is composed of only one type of cells while the complex tissue is composed of different types of cells. For example- parenchyma is a simple tissue which is composed of thin walled polyhedral, isodiametric living cells with sufficient cytoplasm and one or more nuclei. Phloem is a complex tissues that is composed of four elements namely, sieve elements, companion cell, phloem fibres and phloem parenchyma and serves in translocation of organic nutrients.

#464537

Topic: Tissue system

What are the functions of the stomata?

Solution

Stomata are tiny pores present mainly in leaf epidermis. They serve in exchange of respiratory gases (O_2 and CO_2) and transpiration. Transpiration is the process of loss of water that occurs mainly through stomata by movement of water from intercellular spaces of mesophyll cells with higher water potential to the outside air with lower water potential.

#464541

Topic: Tissue

Name the regions in which parenchyma tissue is present.

Solution

Parenchyma is present in soft parts of the plants such as mesophyll of leaves, fruits, flowers and young stem. It is also found in the ground tissue of petiole, mesophyll of leaves as well as in vascular bundles.

#464542

Topic: Tissue system

What is the role of epidermis in plants?

Solution

Epidermis is the protective tissue of plants which forms the outer covering of entire plant surface and protects the underlying tissues. The aerial parts of plants have waxy, water resistant layer on the outer surface of epidermal cells which in turn reduces water loss and provide protection against mechanical injury and invasion of parasitic fungi.

#464543

Topic: Tissue

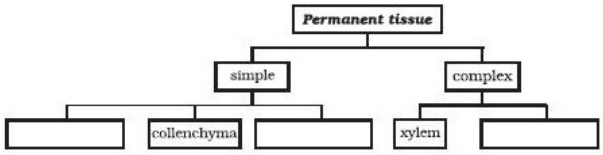
How does the cork act as a protective tissue?

Solution

Cork is protective tissue with dead suberized cells that forms thick and waterproof covering of older stem and root. Suberin is a waterproofing waxy substance which restricts the water movement. Presence of suberin in dead cells of cork and absence of intercellular spaces makes the cells impermeable to water and gases thereby protecting the underlying tissues from desiccation, mechanical injury and pathogenic infection.

#464545

Topic: Tissue



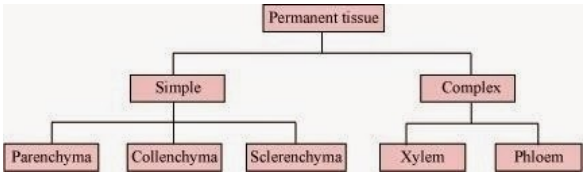
Complete the table.

Solution

On the basis of composition, permanent tissue is divided into 2 parts: Simple and Complex tissue.

Simple tissues are further classified as parenchyma, collenchyma and sclerenchyma.

Complex tissues are further classified as xylem and phloem.



#525965

Topic: Flower

Identify each part in a flowering plant and write whether it is haploid (n) or diploid (2n).

(a) Ovary

(b) Anther

(c) Egg

(d) Pollen

(e) Male gamete

(f) Zygote

Solution

(a) Ovary - It is the female part of the plant which has ovules. It is a diploid (2n) structure.

(b) Anther - It is the male part of the flower and contains pollen grain. It is a diploid structure (2n).

(c) Egg - Ovules are known as egg. It is female gamete present in the ovary. It is a haploid structure (n).

(d) Pollen - Pollens are male gamete. It is a haploid (n) gamete.

(e) Male gamete - Pollens are male gamete. It is a haploid (n) gamete.

(f) Zygote - It is formed by the fusion of male and female gamete. It is a diploid structure (2n).

#525988

Topic: Flower

What is a bisexual flower? Collect five bisexual flowers from your neighbourhood and with the help of your teacher find out their common and scientific names.

Solution

Flower having both male (stamen) and female (carpel) reproductive functional parts is called as bisexual flower.

Examples: Lily *(Lilium longiflorum)*, Rose (*Rosa indica*), Sunflower (*Helianthus annuus*), Tulip (*Tulipa gesneriana*), Daffodil (*Narcissus jonquilla*).

#525992

Topic: Flower

Examine a few flowers of any cucurbit plant and try to identify the staminate and pistillate flowers. Do you know any other plant that bears unisexual flowers?

Solution

Cucurbit has unisexual flowers carrying either male or female reproductive organs. Flowers with male reproductive organs (stamen) are termed as staminate flowers. while those carrying only carpel, are termed as pistillate flowers. Other examples of unisexual flowers are papaya, watermelon, maize etc.

#525996

Topic: Flower

Name the parts of an angiosperm flower in which development of male and female gametophyte take place.

Solution

Pollen is the first cell of male gametophyte while ovule represents female gametophyte. Development of male and female gametophytes takes place in anther and ovary, respectively.