

CHAPTER 4 THE FLOWER

This lesson is for Class 8 for the subject of Biology. Topic 'Various conditions in a flower', which is covered in Chapter 4 The flower starting on Page No 33 of your text book titled - Concise Biology Selina Publications.

Children in the last class we have learnt about the structure of a typical flower. We have discussed the four major whorls of a flower. as -

- 1) First whorl - Sepals (collectively called calyx)
- 2) 2nd Whorl - Petals (collectively called corolla)
- 3) 3rd Whorl - Stamens (collectively called Androecium)
- 4) 4th Whorl - Pistil / Carpel (collectively called Gynoecium)

All these 4 whorls are generally present in a typical flower. But as you all know that in nature (or environment) the variations are common in living organisms. Similarly in flowers the presence / absence or modifications of these 4 whorls of a flower, brings out some specific conditions in a flower and accordingly some specific terms are given to such flowers.

Today we will learn such terms related to different varieties of Flowers as-

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1. Complete or Perfect Flower Flower which contains all the four whorls (namely sepals, petals, stamens, pistil)
2. Incomplete or imperfect flower - Flower in which one or more sets of these four whorls (or floral structures) are missing.
3. Essential parts of flower - Essential are reproductive parts of a flower i.e. those which are directly involved in reproduction process. These parts are stamens (male) and pistil (female). As you know that stamens produce pollen grains and pistil produces ovules. Fertilization of ovules with pollen grains produce seed; thus causing reproduction. Hence these are essential parts of flower.
4. Non essential parts of flower - These are accessory parts which are having secondary functions in a flower. Like we learnt petals make the flower attractive for pollination; petals and sepals protect the reproductive parts (i.e. stamens and pistil). Thus the non essential parts of flower include -
Sepals and Petals.
5. Perianth - In some flowers the sepals and petals look alike (same in colour); hence they are undifferentiated together. Such a condition is called Perianth.

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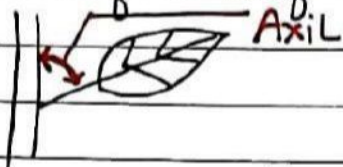
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Now further perianth can be of two types -

Petaloid When the perianth is non green (i.e. the sepals are colourful just like petals) like petals

Sepaloid When the perianth is green like sepals, (i.e. the petals are green in colour).

6. Bracts When a flower arises in the axil of a leaf like structure, this leaf like structure is called as bract. (Axil is the angle between the upper side of a leaf and stem from which it grows)



Bracts may be green like ordinary leaves or at times they are coloured. For eg. in Bougainvillea. The actual flower in Bougainvillea is white small cylindrical attached to inner side of Bract.

7. Nectaries are nectar secreting cells situated usually at the base of the pistil or on the bases of petals. Nectar is sweet fragrant liquid that attracts the insects for pollination. Nectaries are very prominent in Nasturtium.

8. Unisexual or Incomplete or Imperfect flower

A flower which has either the male part (i.e. stamens) or the female part (i.e. carpels)

Eg. Papaya and Palm.

9. Staminate or Male flower

A flower which contains only the male part i.e. the stamens. Anthers of the stamens produce pollen grains which form the male reproductive cells or gametes.

10. Pistillate or Female flower

A flower which contains only the female

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part i.e. the carpels. Ovary of the carpel produces the ovules which encloses the egg cell (female reproductive cell or gamete).

11. Bisexual flower or Hermaphrodite or Perfect

A flower which contains both stamens and carpels. Eg Shoe flower.

12. Neuter flower

A flower in which both male and female reproductive organs (i.e. stamens and carpels) are lacking. Eg Ray florets of sunflower.

Now before going further in the chapter let us take a short break. Answer the following questions during the break.

Q1) Name the essential parts of a flower

Q2) Name the condition in a flower when petals and sepals can not be differentiated

Q3) Name the condition in a flower when both male and female reproductive organs are absent in a flower.

Now you may pause the lesson for a 3 minutes break. Write down the answers to these questions in your notebooks. Break is over children. Listen to the correct answers.

A1) Carpels and Stamens are essential parts of a flower.

A2) 'Perianth' is the condition in a flower when petals and sepals cannot be differentiated

A3) A flower that lacks both male and female reproductive organs is called 'neuter flower'.

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Now let us resume the topic with the discussion of the floral parts.

Children we have learnt about the four whorls of a flower. Now let us describe these four whorls in detail and learn about their structure in detail.

General description of floral parts -

- (i) Calyx Collective term for sepals in a flower.
Polysepalous - When the sepals are free in a flower.
Gamosepalous - When the sepals are fused or joined with each other.

Epicalyx - In some flowers there is another set or series of sepals, hence this additional set or whorl of sepals forms the epicalyx.

Sepals protect the flower during bud stage

- When the flower opens the sepals fall off or may persist.
- Sepals are green in colour but sometimes they are brightly coloured (petaloid condition)
 Eg. in Gul Mohur. sepals are red in colour and are called 'flame of forest'.

- (ii) Corolla Collective term for petals.

Polypetalous - when all the petals are free in a flower

Gamopetalous - when the petals are united or fused to form a tube like structure.

Petals attract insects for pollination. Petals also protect stamens and pistils

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- iii) Androecium collective term for stamens. We have learnt that stamen consists of filament and anther attached to its extremity. Anther has two lobes. Each lobe has two pollen sacs (4 total pollen sacs) which contain pollen grains. When pollen sacs mature they rupture to liberate pollen grains. Pollen grains are yellow powdery particles of various shapes and sizes.

Fig 1
Pollen sac
showing
Pollen grains.



Depending upon the structure androecium may be of following types -

- 1) Polyandrous - When all the stamens are free from each other (not-fused) Eg in Petunia
 - 2) Monadelphous - When all the stamens are joined to form one group (joined/united from their filaments) Eg Chin rose, cotton
 - 3) Diadelphous - When all the filaments (of stamens) in a flower are united in two groups Eg. Pea (in pea, out of 10 stamens, 9 are joined to form staminal tube and one is free)
 - 4) Polyadelphous - Filaments of stamens are united to form several groups Eg. Bombax
- (iv) Gynoecium. Collective term for pistil.

We have learnt that pistil is formed of -

- i) Stigma - Knob like feathery tip of pistil that serves for the landing place for pollens during pollination

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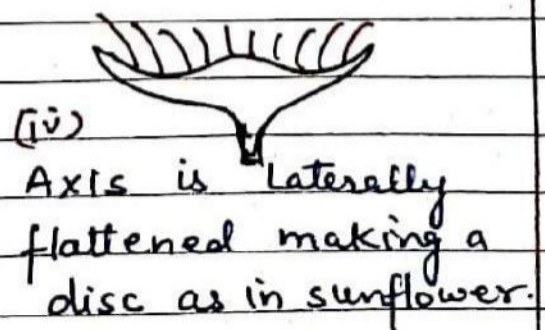
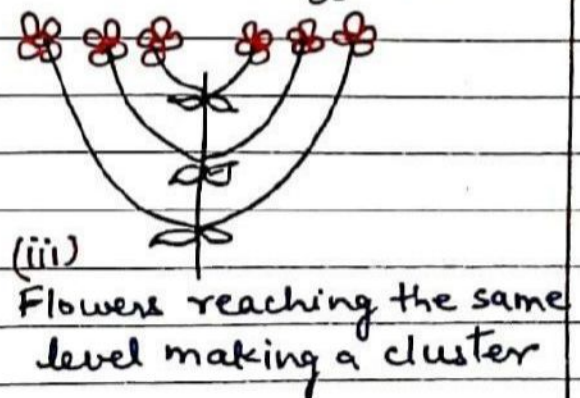
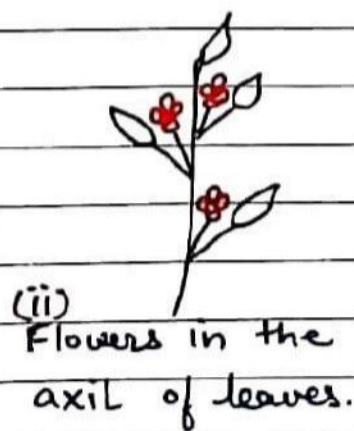
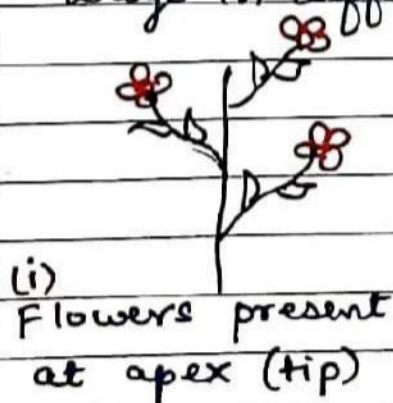
- (ii) Style - tubular stalk to connect stigma to ovary.
(iii) Ovary - base of carpel, internally divided into several chambers or may be having a single chamber. These chambers contain number of rounded bodies ovules. (the female gametes)

Placenta - The cushion or swollen region in ovary attaching the ovules to the wall of ovary.

Sexuality in Plants -

1. Monoecious Plant - Plants bearing both male and female flowers. Eg Maize, cucumber.
2. Dioecious Plant - Plants bearing either the male flower (staminate) or the female flowers (pistillate). Hence in such plants male and female flower grow on different plants Eg Palm, Papaya. Students are required to do 'Progress check' Q1 'True - False' in book itself.

Inflorescence - The mode of arrangement of flowers on the axis of the plant. The flowers may be arranged in several different ways in different plants.



Inflorescence - manner of arrangement of flowers on axis of plant.

Placenta

Tissue that attaches ovules to the wall of the ovary

Placentation

It is the manner in which the ovules are arranged / attached to the wall of the ovary. After fertilization [fusion of pollen grains with ovules] the ovules change into seeds and ovary transforms into fruit.

Dear students with this I am ending today's discussion. Kindly go through the given explanation and with reference to the detailed explanation you are required to answer the following home assignment questions -

Home Assignment -

Q1. Answer the following 'Review questions' given at the end of chapter 4 [Page - 37] of your text book.

C Short Answer type

Q No 1 and 4

E Structured / Application / Skill type

Q No 2 and 3