Date:

Exp:No: 06

**Floral structure of Hibiscus rosasinensis(shoe flower)**

*(Summarize the information presented in this lab by creating a* ***brief outline*** *and writing it in your lab report. Your outline should include the following sub headings:)*

Aim: to study the floral structure of Hibiscus rosasinensis(shoe flower)

Materials required:

fresh flower(s) dissecting needle

hand lens microscope scalpel or razor blade

plain paper forceps

clear tape metric ruler

Procedure:

1. Obtain a single flower and observe its parts carefully. Flower parts are arranged in a circular pattern. Each circle is called a **whorl(petals)**. The whorls are attached at the enlarged **receptacle** located at the base of the flower.
2. ***Please read this overview before you begin your flower dissection:*** As you examine your flower, you will be carefully removing parts beginning with the outer whorl and working your way in towards the pistil. You will arrange each whorl in a circle on the plain paper, beginning with the sepals as the largest outermost circle. As you proceed with your dissection, you will carefully tape each whorl of flower parts into position and label them (please use pencil!).
3. As each whorl is observed and removed, you will complete the appropriate information in the **Observations** column of the chart. Use the information in the handout to complete the **Function** column of the chart.
4. The **sepals** form the outermost whorl of the flower. The sepals are leaf-like structures that are usually green in color. Sometimes, the sepals are the same color as the petals, or appear to be another set of petals of a different color. The function of the sepals is to protect the inner part of the flower before it blossoms. **Gently remove the sepals**, tape them into position onto the paper, and label them.
5. The petals are found directly under the sepals. The color and odor of the petals help to attract birds and insects to the flower for pollination. **Gently remove the petals**, tape them into position onto the paper, and label them.
6. The stalk-like structures inside the petals are the **stamens**, the male reproductive organs. Depending on the species, the stamens may be attached to the receptacle, to the petals, or to the pistil. The enlarged portion at the top of the stamen is the **anther**. Inside the anther are **pollen sacs**, which produce pollen grains. When the **pollen grains** mature, the pollen sacs split open, releasing the dust like pollen grains. The filament is the thin structure that supports the anther. **Gently remove the stamens**, tape them into position onto the paper, and label them.
7. The central structure of the flower is the female reproductive organ, the **pistil**. The top of the pistil is the **stigma**. When mature the stigma is enlarged, and its surface is moist and sticky. The **style** is the middle portion of the pistil. It supports the sigma. Some flowers lack a style. The **ovary** is the enlarged structure at the bottom of the pistil. The ovary contains one or more hollow compartments known as **locules**. The locules contain **ovules**, which in turn, contain the **egg nuclei**. **Carefully remove the pistil** by cutting it from the stem just under the ovary. Using pencil, **make a life-sized sketch of the entire pistil** (just the outline) in the center of the plain paper and label it. **Cut** the style just at the top of the ovary, **tape** it next to your sketch, and **label the stigma and style**. Using the ruler, **measure the length of the style** in millimeters. **Cut a thin cross-wise section of the ovary** and **tape** it under the stigma and style.

**Observation:**

**(record your observation by answering the following questions)**

1. How many sepals does your flower have?
2. Describe the appearance of the sepals (color, markings, etc.)
3. How many petals does your flower have?
4. Describe the appearance of the petals (color, markings, etc.).
5. How many stamens does your flower have?
6. To which structure(s) were the filaments attached.
7. Have the pollen sacs opened? How can you tell?
8. If pollen grains are visible, describe their appearance.
9. Describe the appearance of the stigma. Is the stigma mature? How can you tell?
10. How long is the style (in mm)?6.5cm
11. Describe the appearance of the ovary.

**Discussion**

 The **angiosperms** are seed-bearing plants that produce flowers. The seeds, which contain the plant embryo, are produced in the flower. All the parts of a flower are actually modified leaves that are specialized for their roles in the reproductive process. Flower parts are arranged in circles called **whorls**. They are attached at the enlarged base of the flower, the **receptacle**.

 Flower structures can be divided into two groups: the essential organs and the accessory organs. The **essential organs** are the reproductive structures, which include the **stamens** (male) and the **pistils** (female). The **accessory organs** are the **sepals** and **petals**, which surround and protect the essential organs.The **stamen** is the male reproductive organ and consists of two parts: the anther and the filament. The **anther** is the enlarged structure at the top of the stamen. Inside the anther are **pollen sacs**. Special cells within the pollen sacs undergo meiosis to form **pollen grains**. Each pollen grain contains two **sperm nuclei**. When the pollen grains mature, the pollen sacs split open to release the dust-like **pollen**. The **filament** is a thin stalk that supports the anther.The **pistil** is the female reproductive organ and consists of three parts: the stigma, style, and ovary. The **stigma** is an enlarged portion at the top of the pistil that becomes moist and sticky when mature. The **style** is the middle portion of the pistil. It can be long and slender, short, or even absent, depending upon the species. The **ovary** is the enlarged structure at the bottom of the pistil. The ovary contains one or more hollow compartments called **locules**. Each locule contains one or more **ovules**. Special cells within the ovule undergo meiosis to form **ova (eggs)** containing **egg nuclei**.

**Pollination** occurs when pollen grains land on the sticky surface of the stigma and are trapped there. The pollen grain germinates and a **pollen tube** emerges from the grain. It releases special enzymes that digest a cell the wall on the surface of the stigma. The pollen tube grows down through the style to the ovary and enters the ovule, making a continuous passageway for the two sperm nuclei to enter the ovum. **Fertilization** occurs when the sperm nuclei join the egg nuclei.The fertilized egg becomes an **embryo**. The wall of the ovule thickens and forms a **seed**, thus enclosing and protecting the embryo. The ovary wall also thickens and develops into a **fruit**. In some plants such as apples, the ovary walls become fleshy and contain stored sugars and starches. In other plants such as walnuts, the ovary walls become dry and hard.

**Label the following:**

Whorls: calyx, corolla, pistil/carpel: stigma, style, ovary, ovules, stamen: anther, filament, pollen tube, sepals, petals, receptacle

1. How many sepals does your flower have?5
2. Describe the appearance of the sepals (color, markings, etc.)green
3. How many petals does your flower have?5
4. Describe the appearance of the petals (color, markings, etc.).pinkinsh white
5. How many stamens does your flower have? numerous
6. To which structure(s) were the filaments attached style
7. Have the pollen sacs opened? How can you tell? Closed
8. If pollen grains are visible, describe their appearance. spiky sticky
9. What color is the pistil?whitish yellow
10. Describe the appearance of the stigma. Is the stigma mature? How can you tell?orange, sticky, ranched
11. How long is the style (in mm)?6.5cm
12. Describe the appearance of the ovary. yellowish white capsule