Welcome to the lecture in the paper, Plant Anatomy and Embryology. I am Ms. Divyarani Revankar and I'll be covering module number 26, epidermal appendages, under the unit, adaptive and protective system. Outline- Introduction to epidermal appendages in plants and types of epidermal appendages.

Learning outcomes- To describe the epidermal appendages and its types. Trichomes- trichomes are defined as the unicellular and multicellular appendages of the epidermis and it is found all over the plant body, which is known as ubiquitous in nature. The trichome develops as a protuberance from an epidermal cell. It further elongates, divides and further develops into multicellular hair. Trichomes are a very important tool in plant taxonomy, where it is used for classification up to family level, genera level, and species level.

Functions of Trichomes: Trichomes control the rate of transpiration in plants. It decreases the heating effect of plants from the sunlight and protects the plant from injuries. There are different kinds of trichomes. They may be single or in groups and of different sizes. Trichomes can be unicellular or multicellular. They can be small, complex and branched. The cells of the heads of the trichome may be dead or living.

Based on all these parameters, there are different hair types. The trichomes are classified into unicellular and multicellular types based on morphology. Unicellular means that they are made up of a single cell and they may be branched or unbranched. Multicellular means that they consist of a single row of cells or several layers of cells. Some are branched like a tree and some have branches largely in one plane as seen in stellate hairs.

In this picture you can see the unicellular trichomes. It shows only a single cell. There are cottony hair type unicellular trichomes which have wavy like structure and it looks like a cotton hair. Then you have cystoliths.

Trichomes are categorized based upon the presence and absence of glands. Also, these are some types of trichomes such as, stinging hairs, glandular hairs, peltate hairs, uniseriate hairs, stalked trichomes, bladder like trichomes, non glandular types, ramentum, laticiferous hairs, stellate. Hooked and multi seriate hairs.

Let's have a look at these trichome hairs. Now the stinging hairs they contain poisonous fluid and the base is bulb like. As you can see in the picture here. This is the base OK. The tip of this trochome is oblique which are pointed end. So when an animal or a human comes in contact with this type of hair, the tip is broken off and the sharp end penetrates through the skin and the fluid gets transferred from the basal bulb into the body of the animal.

The next type is glandular hairs. Now these glandular hairs are found on leaves, branches. They secrete a sticky substance like oils, resins, or mucilage. It possesses a stalk, as you can see in the picture, this is the stalk OK and the terminal portion is called as the gland. OK, so it is glandular hairs. Now these glandular hairs may be unicellular or multi cellular in nature. And these substances, which are excreted and accumulated between the walls and the cuticle. The final removal from the hair occurs by rupture of the cuticle, so when an animal feeds upon such plants, the glands stick to their mouth and they find it very difficult to brush them off. So plants bearing such glands are never attacked by grazing animals. Example tobacco plant, *Jatropha* plant and *Plumbago* plant.

The next type of hairs are scale or peltate hairs. Peltatus means that their target shaped or shield like. It consists of a discoid plate of cells and they're borne on a stalk or they are attached directly to the foot. As you can see in the picture here, this is the Foot,this is the stalk and this is the disk type cells. The cell walls of the trichomes are of cellulose and are covered with a layer of cuticle.

Now these cells or these hairs may be lignified. Also, plant hairs are said to produce thick secondary walls. Cystoliths and crystals may be developed in these type of trichomes.

The next type of trichomes is Uniseriated trichomes. That means it is a single line cells. Now here you can see the collapsed cells where the cells are collapsed and they are reduced in protoplasm.

The next type is stalked sells OK. Now here you can see here these are the stalked cells OK, on which the gland is at the tip of the trichome. The next type is bladder like hairs. The trichome is in the shape of a

bladder. OK, so here this is the bladder shaped trichome.

The next type is non glandular hairs, they are formed either by the prolongation of the outer wall of the epidermis or by the transverse division of these cells. The outer cell develops into a trichome and the inner cell forms a basal cell in the epidermis. The non glandular cells may be dead or living type with little cytoplasm present in it. Next is the Ramentum type of trichome. In *Nephrolepis* plant, these tricone look like this.

Next type is stellate hairs. Now here in this picture you can see the star shaped cells. OK, they are actually the hairs which is found on Cedar leaf. The next type is hooked hairs which form a hook like structure. There basically unicellular and these hooked hairs are from *Nyctanthus* Leaf.

The next type is unicellular branched head. Such trichomes are found below the leaf. The next type is multiserialte hairs. You will find multiple cells which are in the trichomes so these multiseriate hairs are found in some plants.

These are the references, you can refer to these references for more reading.