

Hello everyone myself, Miss Shubhra Bhende from Government College of Arts, Science and Commerce, Kepem, assistant professor.

Program: Bachelor of Science, Second year subject botany Semester 3 course code 103. Course title, plant anatomy and Embryology. Title of the unit embryo and endosperm seed structure. Module name, structure of the mature seed. Outline major seed structure of dicot and monocot seed. Learning outcomes defines a mature seed, describes the structure of dicot and monocot seed. Now we will see what is a mature seed, what are its components and structure. A true seed is defined as a fertilized, mature ovule that possesses embryonic plant that is with radical and plumule stored material and a protective seat coat or seed coats. Now here we have an image A is a dicot. Image A is a dicot seed and B is a monocot. See now the basic difference over here we can see the seed coats in dicot there are two seed coats in monocot there is a single seat coat. Now we will see in the next slides the in detail structure of a dicot seed and a monocot seed. First is structure of mature seed. We could see the example we have taken is by *Pisum sativum*. Now the peas, some sort of warm seeds. They are formed in pods, so when we open a pod and look at the seed they are seeds are attached to the fruit wall by a small stock that is called as funiculus. When we are opening the seed. When we're opening the pod, we can see the attachment at one side of the seed coat. A narrow elongated scar representing point of attachment of seed to its stock is called hilum. We can see hilum, it is labeled over here. This hilum and other parts we cannot see by naked eye. When you observe this seed under the microscope there we can see this hilum. Close to hilum there is a minute pore called **micropyle**. This is a **micropyle** region when the seeds they absorb water during the germination, when they are sown and they absorb water, this is the **micropyle** region from where the water is absorbed into the seed and then the germination process begins Continuous with the hilum There is a sort of ridge in the seed coat that is the **raphe**. Here **raphe** is being labeled. It is just a distinction between the two cotyledons. The seed is covered by two distinct seed coats, that is **testa** and **tegmen**. Here we can see the outer layer testa and inner membranous layer that is tegmen. There is a whitish fleshy body which is called as the embryo consisting of two fleshy cotyledons, which are labelled over here. There is a short exist to which the cotyledons remains attached. That is the middle portion. The position of the axis lying outside cotyledons, bent inward and directed towards micropyle is **radicle**. The radical is labelled. Now radical is the part which gives rise to the root initials. The other portion lying in between the two cotyledons is the plumule. Here the plumule is being labelled, which is going to give rise to the further leaf tissues. Reserve food material is stored in the cotyledons. Here, there is no endosperm tissue because all the food materials it is being stored in the cotyledons. Now we will see the structure of monocot seed. Here we have taken the example of Zea Mays. Now this is a single seeded fruit with unseparable seed coat and fruit the fruit wall and the seed coat they are not separable and the seed coat is single layered in case of monocot. Embryo lies embedded in a small opaque whitish deltoid area. We can see here the position of the embryo in both the section thin layer surrounds the grain which is called as the seed coat actually does not perform the function of the seed coat because it is very thin in structure. Now the monocot grain it is divided into 2 unequal portion by a definite layer that is the epithelial layer which we can see. It is starting from here and ending over here. This layer is called epithelial layer. Now the bigger portion is the endosperm. This is the bigger portion which is labelled as the endosperm, while the smaller portion is the place where the embryo is going to lie. Now, embryo consists of one shield shaped cotyledon that is scutellum. Now there is no exact function for scutellum because all the nutrition to the growing embryo is provided by the endosperm tissue, which was absent in dicot seed.

Now the upper portion of the axis is the plumule and the lower portion is with root cap is **radicle**. Now what is the function of plumule and root cap or radical? We have seen in the last slide that is for dicotyledon monocot seed plumule radicle both are going to give rise to root and shoot. Now it's been showing structures of seed apart from now what we have seen in both the monocot and dicot seed there are some special structures. Now if we take the example of Castor bean, there is a fleshy whitish tissue which is called as the caruncle which develops at one end of the seed which is derived from the integuments. Then second example is juicy edible part of lychee fruit that we call aril. It is an outgrowth of the funiculus that develops after fertilization. Third example we have taken is of cotton fibers which are elongated epidermal hairs of seedcoat. Now these are these special structures apart from what we have seen in the last slide. These are some of the references.

Thank you.