

Difference Between Epicotyl and Hypocotyl

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Key Difference - Epicotyl vs Hypocotyl

Seed germination is an important aspect of the development of a plant. The mechanisms it utilizes for germination only occurs when the right conditions for germination are present. Seeds do not germinate when the environmental factors are not favourable. This is called seed dormancy. Once a seed germinates, it will grow into different structures that are the preliminary structures of plant growth. Hypocotyl and epicotyl are two such important structures. **The epicotyl is a portion of the embryonic axis that lies between cotyledons and the plumule while the hypocotyl is the portion of the embryonic axis that lies in between the point of attachment known as the cotyledonary node and the radicle.** This is the **key difference** between epicotyl and hypocotyl.

What is Epicotyl?

Epicotyl is a portion of the embryonic axis that lies between cotyledons and the plumule. An epicotyl is an essential part of a plant in the initial stages of a plant's life. During hypogeal germination, the epicotyl is elongated that the plumule is pushed above the soil surface leaving the cotyledons to remain in the soil. The epicotyl forms the important part of the embryonic shoot system. An epicotyl is situated in the region in the stem of a seedling that is situated above the stalks of the seed leaves in the embryo plant. An epicotyl usually grows very rapidly while extending the stem above the ground. It also shows hypogeal germination during growth where a hook-like structure is formed during the germination process.

The epicotyl forms the shoot apex and leaf primordial by expanding and elongating above the ground while the cotyledon will remain below the surface of the ground. The epicotyl is known as the embryonic shoot that is above the cotyledons. Eventually, the epicotyl will be developed into leaves of the plant receptors known as phytochrome photoreceptors that are found to be controlling the lengthening of the epicotyl throughout. Epicotyl is terminated with the plumule.

In dicotyledonous plants, the stem located at the base that is under the cotyledons is called the hypocotyl while the shoot above the cotyledon is called the epicotyl. In the monocotyledonous plants, from where the shoots and leaves emerge initially, the first shoot that appears above the ground or from the seed is known as the epicotyl.

What a Hypocotyl?

The hypocotyl is the portion of the embryonic axis that lies in between the cotyledonary node and the radicle. The hypocotyl forms the important portion of the embryonic root system. The hypocotyl of a plant is the stem of a germinating seedling that is found above the radicle and below the cotyledons. The hypocotyl is known to be the primary organ of a young plant that helps the plant to extend and to develop into a stem.



Figure 01: Hypocotyl: Cyclamen

This radicle eventually becomes the primary root where it will be penetrated down into the soil afterward. During the epigeal germination, the hypocotyl is elongated that the cotyledons are pushed out of the soil surface. The hypocotyl emerges and the tip that is growing including the seed coat is lifted above the ground once the radicle emerges. The lifting growing tip would be bearing embryonic leaves called the cotyledons and the plumule that gives rise to mature true leaves later. The hypocotyl may become enlarged and function as a storage organ in some plant. For example, in Cyclamen the hypocotyl acting as the storage organ is called the tuber.

What is the Similarity Between Epicotyl and Hypocotyl?

- They are preliminary structures of plant growth after seed germination

What is the Difference Between Epicotyl and Hypocotyl?

Epicotyl is a portion of the embryonic axis that lies between cotyledons and the plumule.	The hypocotyl is the portion of the embryonic axis that lies in between the point of attachment known as the cotyledonary node and the radicle.
Termination	
Epicotyl is terminated with the plumule.	The hypocotyl is terminated with the radical.

Summary - Epicotyl vs Hypocotyl

Seed germination is an important aspect of the development of a plant. Epicotyl is a portion of the embryonic axis that lies between cotyledons and the plumule. An epicotyl is an essential part of a plant in the initial stages of a plant's life. The epicotyl forms the shoot apex and leaf primordial by expanding and elongating above the ground while the cotyledon will remain below the surface of the ground. Epicotyl is terminated with the plumule. The hypocotyl is the portion of the embryonic axis that lies in between the point of attachment known as the cotyledonary node and the radicle. The hypocotyl forms the important portion of the embryonic root system. Radicle eventually becomes the primary root. The hypocotyl is terminated with the radicle. This is the difference between epicotyl and hypocotyl.

Reference:

1. "Hypocotyl." Encyclopædia Britannica, Encyclopædia Britannica, inc. [Available here](#)
2. "Epicotyl." Encyclopædia Britannica, Encyclopædia Britannica, inc. [Available here](#)

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