

Difference Between Endosymbiont and Endophyte

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Key Difference - Endosymbiont vs Endophyte

Symbiosis is an interaction between two types of organisms which live closely with each other. There are three major types of symbiosis named **commensalism**, **mutualism**, and **parasitism**. In mutualistic symbiosis, both organisms benefit due to this relationship. Endosymbiont and endophyte are two types of organisms which show mutualism. **An endosymbiont is an organism which lives within the body or cells of another organism in a mutualistic interaction. An endophyte is an organism, often a bacterium or a fungus, that lives inside the plant cells in a mutual interaction.** This is the key difference between endosymbiont and endophyte. Endophyte itself is an endosymbiont.

What is an Endosymbiont?

An endosymbiont is any organism that lives within the body or cells of another organism, resulting in mutual benefits for both parties. The best example for endosymbiont is the bacterium *Rhizobium* which lives in **legume** plant root nodules. *Rhizobium* fixes atmospheric **nitrogen** into **nitrate** while inhabiting the legume plant root cells. These nitrates are utilized by the host plant. Another example of endosymbiotic interaction is the single cell algae which live inside reef-building corals. The relationship between a termite and the microorganisms in its gut is another endosymbiotic interaction.

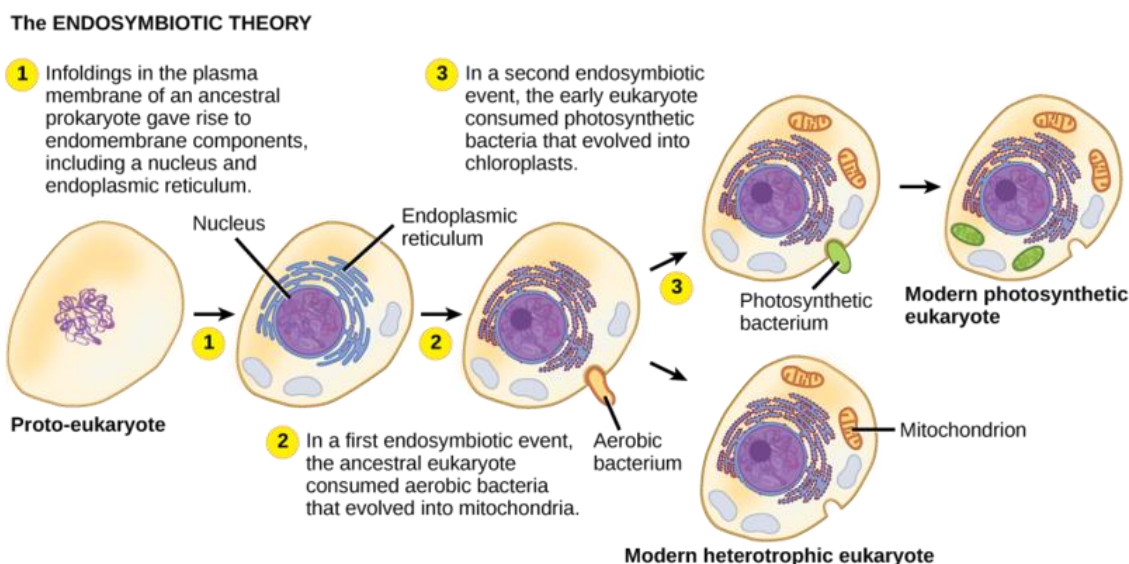


Figure 01: Endosymbiosis of Mitochondria and Chloroplast

Most endosymbionts show obligate interaction with host organism. They cannot live without the host organism. But some endosymbionts do not show obligate endosymbiosis. [Mitochondria and chloroplasts](#) are two organelles in eukaryotic cells which evolved as bacterial endosymbionts.

What is an Endophyte?

Endophyte is an organism that lives between living [plant cells](#). Endophytes are often [bacteria](#) or [fungi](#). They live within plant cells, at least for a part of their life cycle. They do not cause diseases in plants. Instead, they help plants in many ways. In other words, endophyte can be defined as an endosymbiont which mutually interacts with plants. Endophytes aid plants in growth, nutrient acquisition, and tolerating [abiotic](#) stresses such as drought, resisting insect attacks, facing plant pathogens, etc.

Endophytes were first discovered by German botanist Heinrich Friedrich Link in 1809. They have found in almost all plant species studied yet. There are diverse types of bacterial and fungal endophytes. Fungi which grow associated with other plants are known as mycorrhizal fungi. These mycorrhizal fungi obtain carbon from the host plant while supporting the host plant in phosphorus and nitrogen acquisition. Hence mycorrhizal fungi are important in agriculture. They increase the crop nutrition and support for faster growth. They assist plants in tolerating environmental conditions and pathogenic attacks. All these functions are done by a wide range of chemicals produced by endophytes.

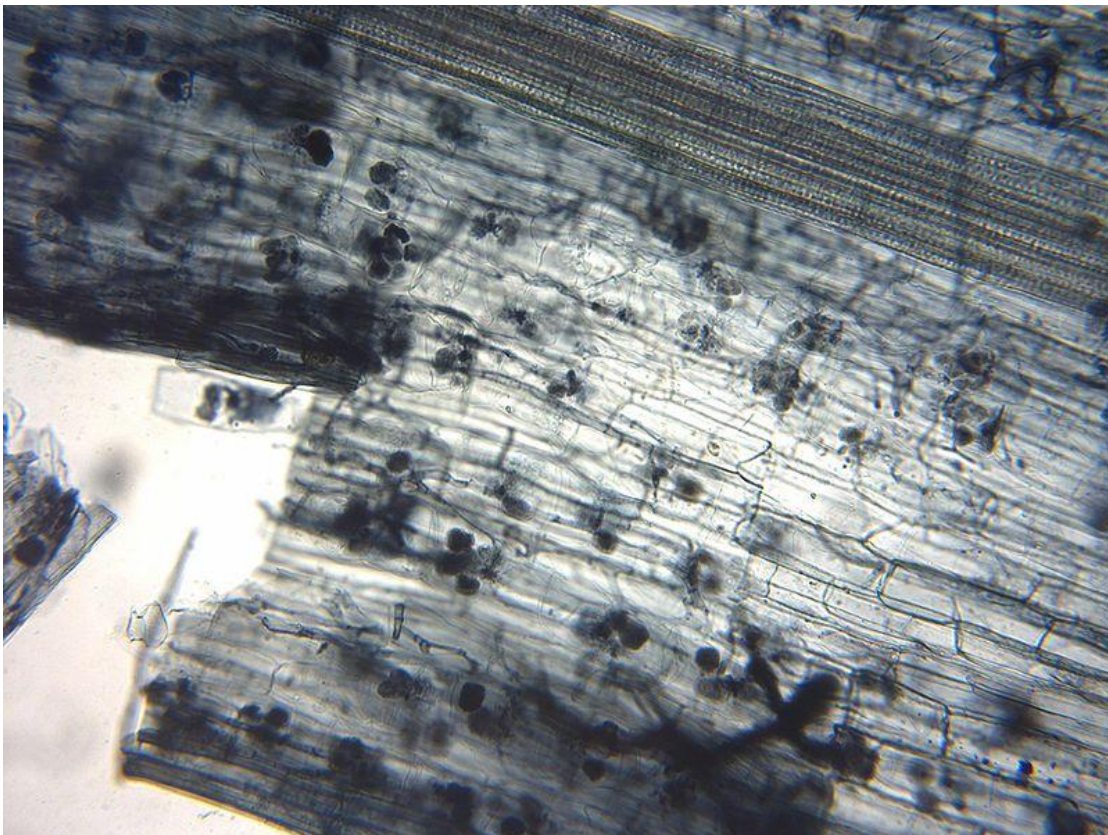


Figure 02: Example of an endophyte - Mycorrhizal fungi under a microscope

Endophytic fungi are transmitted from plants to plants either by vertical transmission or horizontal transmission. Vertical transmission occurs from parent to offspring. Horizontal transmission occurs via sexual and asexual reproduction of fungi. Through horizontal transmission, endophytic fungi spread into plant populations or into plant communities.

What are the similarities between Endosymbiont and Endophyte?

- Endosymbiont and endophyte live within living cells or organisms.
- Endosymbiont and endophyte interact with the host organism without harming it.
- Both are benefitted by the interaction with host organism.

What is the difference between Endosymbiont and Endophyte?

Endosymbiont vs Endophyte	
Endosymbiont is an organism that lives within living cells or an organism.	Endophyte is an endosymbiont which lives within plant cells.
Value	
Endosymbiont can have a mutualistic interaction with any type of living organism.	Endophytes live only within plant cells.

Summary - Endosymbiont vs Endophyte

In mutualism, both species are benefitted and are dependent on each other for the survival. Endosymbionts are symbiotic organisms living inside the living cells or living organism for mutual benefits. Most endosymbionts associate closely with each other. Endophyte is an endosymbiont which lives inside the plant cells. The main difference between endosymbiont and endophyte is that endosymbiont is an organism which lives within any type of living cells or organisms while endophyte is an endosymbiont which lives only within plant cells.

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2. "Arbuscular mycorrhiza microscope" By Msturmel - MS Turmel, University of Manitoba, Plant Science Department (Public Domain) via [Commons Wikimedia](#)

References:

1. "Endosymbiont." Wikipedia. Wikimedia Foundation, 06 June 2017. Web. [Available here](#). 03 July 2017.
2. "Endosymbiosis." Animal Sciences. Encyclopedia.com, n.d. Web. [Available here](#). 03 July 2017.
3. "Endophytes and Plants - Boundless Open Textbook." Boundless. Boundless, 26 May 2016. Web. [Available here](#). 03 July 2017.

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APA: Difference Between Endosymbiont and Endophyte. (2017, July 05). Retrieved (date), from <http://www.differencebetween.com/difference-between-endosymbiont-and-vs-endophyte/>

MLA: "Difference Between Endosymbiont and Endophyte." Difference Between.Com. 05 July 2017. Web.

Chicago: "Difference Between Endosymbiont and Endophyte." Difference Between.Com. <http://www.differencebetween.com/difference-between-endosymbiont-and-vs-endophyte/> (accessed [date]).



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