

Difference Between Self and Cross Fertilization

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Key Difference - Self vs Cross Fertilization

The fusion of [male and female gametes](#) during the [sexual reproduction](#) to initiate the development of a new individual is '[fertilization](#)'. Fertilization can happen in two ways; self fertilization and cross fertilization. Self fertilization occurs between the male and female gametes of the same individual. Cross fertilization occurs between the male and female gametes of the different individuals of the same species. The **key difference** between the self and cross fertilization is that **self fertilization involves only one individual whereas cross fertilization involves two different individuals of the same species.**

What is Self Fertilization?

Self fertilization is the process of uniting female and male games of the same individual during the sexual reproduction. Self fertilization is seen comparatively less among the organisms. In plants, [monoecious plants](#) show self fertilization. Self fertilization reduces the genetic diversity of the organisms. Hence, most of the organisms use preventive methods to stop self fertilization and promote cross fertilization. Self fertilization is achieved through self pollination. By the self pollination, [pollens](#) of the same flowers drop into the [stigma](#) of the same flower for the self fertilization. Self fertilization is seen in bisexual organisms including [protozoans](#), certain flowering plants and several invertebrates.

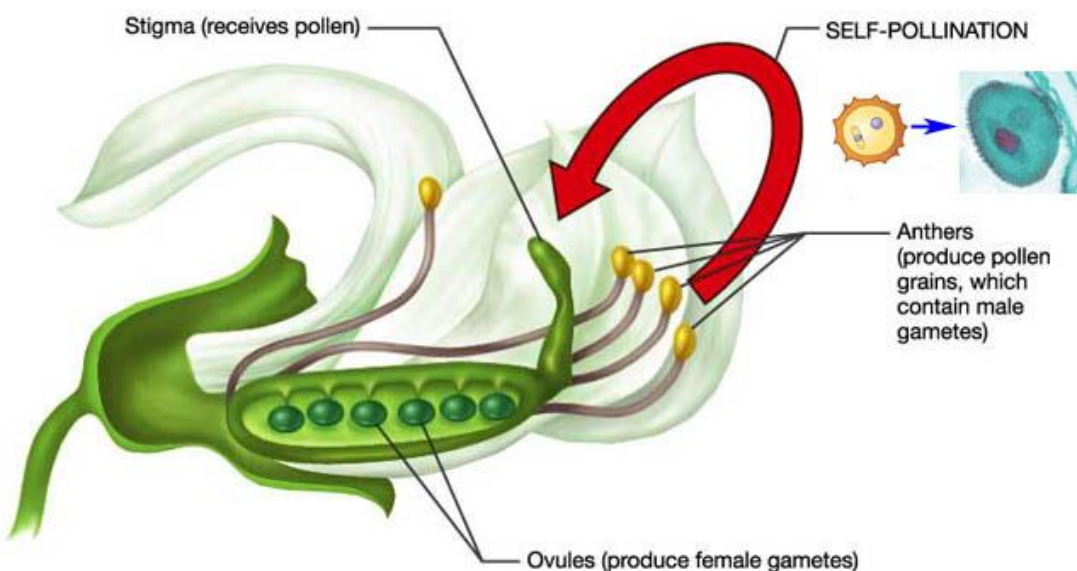


Figure 01: Self Fertilization

Self fertilization increases the chance of expressing harmful recessive characteristics in offsprings. Offsprings of the self fertilization are less adapted to the changing environments, and their survival is less compared to the offsprings of the cross fertilization. However, self fertilization is utilised to maintain desirable genetic traits in the offspring generations.

What is Cross Fertilization?

Fertilization is the process of uniting a male gamete with a female gamete. When a female sex cell fuses with a male sex cell of a different individual of the same species, it is known as cross fertilization. In other words, cross fertilization is the process of fusing male and female gametes of different individuals of the same species. In plants, cross fertilization occurs in [dioecious plants](#). In animals, it occurs between separate female and male organisms. Even in animals possessing both female and male sex organs, cross fertilization can be seen due to different methodologies they follow to prevent self fertilization.

In aquatic environments, cross fertilization occurs externally. However, in terrestrial organisms, fertilization process occurs inside the body of the female, and it is known as internal fertilization. Cross fertilization is an important process since it increases the diversity of the organisms. Both parents contribute genes into gametes, and new gene combinations flow to the offsprings. Therefore, the offsprings are genetically diverse from their parents, and they are more adapted to survive in the new environments.



Figure 02: Cross Fertilization

Cross pollination helps flowering plants for cross fertilization. Unisexual plants do cross pollination with the help of different factors such as insects, wind, water etc.

What are the Similarities Between Self and Cross Fertilization?

- In both processes, a fusion of sex cells occurs.
- Both fertilization methods produce an offspring.
- Both can be seen during the sexual reproduction.

What is the Difference Between Self and Cross Fertilization?

Self Fertilization vs Cross Fertilization	
Self Fertilization is the union of male and female gametes of the same individual.	Cross Fertilization is the fusion of male and female gametes of different individuals of the same species.

Genetic Diversity	
Self Fertilization reduces the genetic diversity.	Cross Fertilization increases the genetic diversity.
Possibility	
Plants have different modifications to reduce self fertilization.	Plants have different modifications to encourage cross fertilization.
Achievement	
Self Fertilization is achieved via self pollination.	Cross Fertilization is achieved via cross pollination.
Seen in	
Self fertilization is seen in bisexual organisms.	Cross fertilization is seen in unisexual organisms.
Mixing of Traits	
Mixing of traits of two individuals does not occur in self Fertilization.	Mixing of the traits of two different individuals occurs in cross Fertilization.
Variation of Offsprings	
Self Fertilization does not show variation among the offsprings.	Cross Fertilization increases the variation among the offsprings.
Harmful Recessive Traits	
By repeated self fertilization, harmful recessive traits can be expressed in the offsprings.	Cross fertilization does not cause the expression of harmful recessive traits.

Summary - Self vs Cross Fertilization

Self-fertilization is the fusion of male and female gametes (sex cells) produced by the same individual. Cross fertilization is the fusion of male and female gametes produced by the different individuals. Self fertilization is allowed to maintain the local population and desirable genetic traits, yet it reduces the genetic variation among the offsprings. Cross fertilization increases the adaptability of the organisms to survive in the changing environments and also it reduces the emergence of the harmful traits coming from recessive alleles. This is the difference between self and cross fertilization.

Reference:

- 1.The Editors of Encyclopædia Britannica. “Cross-Fertilization.” Encyclopædia Britannica, Encyclopædia Britannica, inc., 20 July 1998. [Available here](#)
- 2.“Autogamy.” Wikipedia, Wikimedia Foundation, 14 Jan. 2018. [Available here](#)

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- 2.'Cross Pollination (468246966)'By Snap® from Kuwait, Kuwait - Cross Pollination, [\(CC BY 2.0\)](#) via [Commons Wikimedia](#)

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