Difference Between Stamen and Pistil

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Key Difference - Stamen vs Pistil

The flower is considered as the reproductive organ of angiosperms (flowering plants). It is composed of the male reproductive unit (androecium) and the female reproductive unit (gynoecium). Stamen is composed of anther and filament. The pistil is composed of stigma, style, and ovary. Both structures together involve in sexual reproduction. The stamen (anther) involves in the synthesis, and the release of pollen grains whilst the pistil involves in receiving the pollen grains through stigma, providing the adequate conditions for germination and providing a site for fertilization (ovary). The **key difference** between stamen and pistil is that **stamen is the male reproductive organ which produces pollens of angiosperms while pistil is the female reproductive organ which produces ovules of angiosperms.**

What is Stamen?

The stamen of the flower is referred to as the male reproductive unit. This is also called as the androecium. It is composed of anther and filament. The anther is held by the filament which is a long structure. The filament is also known as the stalk. The stamen is an individual component of the flower, and the number of stamens present in flower varies according to the type of plant species. They are located centrally in flower, and at average levels, there are about 5 to 6 stamens present in each flower.

The anther involves in the production of pollen grains. Once the pollen grains are mature, they are released into the external environment that will be received by the stigma which is the female reproductive unit of the flower. The filament is an important structure for pollination. If the flower prefers self pollination, the filament will make the anther bent towards the stigma of the same flower. If it prefers cross-pollination, the filament makes the anther to be bent away from the stigma.

Figure 01: Stamen

During the analysis of a cross-section of an angiosperm anther, two distinct lobes can be identified. At each lobe two microsporangia are present. These are referred to as thecae. Angiosperm anther possesses four theca or microsporangia. Each microsporangium consists of 4 cell layers from outside to the inside; epidermis, endothecium, middle layers and tapetum. The outer three layers involve in releasing pollen grains once they are mature. The tapetum provides adequate nourishment to the developing pollen grains within the pollen sac. The pollen grains develop through mitotic division. Once they are matured within the pollen sacs, they are released into the external environment for germination. The fate of the pollen grains depends on different pollinating agents.

What is Pistil?

The pistil is the female reproductive unit of the flower. In other terms, it is referred to as the gynoecium. The pistil consists of three main units; stigma, style, and ovary. The stigma is present at the distal end of the style. It is located at a higher level in the gynoecium in order to receive mature pollen grains. The stigma or the pollen-receptive tip of the gynoecium possess a special type of structures referred to as stigmatic papillae. These structures act as receptive cells to mature pollen grains.

Once released from the anther, the pollen grains get desiccated due to the conditions of the external environment. Rehydration is facilitated by the sticky nature of the stigma and thereby provides adequate conditions for the germination of pollen grains. This results in the generation of the pollen tube that grows towards the ovary through the style. Stigma also involves the recognition of the specific pollen grains for a particular species. If the pollen specificity is not ensured, the stigma initiates rejection mechanisms.

Figure 02: Pistil

The ovary is an enlarged portion that is present at the base of the pistil involves in the production of ovules. According to the position of the ovary in flower, it is of three types; superior ovary (attached to the receptacle above other floral attachments), half-inferior ovary (partially embedded in the receptacle) and inferior ovary (completely embedded by the receptacle and all other floral attachments are present above the ovary). Once the pollen tube enters the ovary through a pore referred to as the micropyle, it releases the male gamete which reaches the ovule and fuses with it to form a zygote. This is known as fertilization.

What is the Similarity Between Stamen and Pistil?

- Both involve in the reproduction and are considered as the reproductive units of the flower

What is the Difference Between Stamen and Pistil?

Stamen vs Pistil	
Stamen is referred to as androecium which is the male reproductive unit of the flower	The pistil is the female reproductive unit of the flower and consist of a pollen-receptive tip known as stigma which provides adequate

and involves in the production and release of pollen grains.	conditions for pollen germination and an ovary which consist of ovules where fertilization take place.
Components	
Components of the stamen are anther and filament.	Components of the pistil are a stigma, style, and ovary.
Function	
Stamen is involved in the production and release of pollen grains.	The pistil is involved in receiving pollen grains, the formation of pollen tube and providing ovules for fertilization.

Summary - Stamen vs Pistil

Stamen and pistil are the reproductive units of a flower. Stamen is referred to as androecium which is the male reproductive unit of the flower, and it involves in the production and the release of pollen grains. The pistil is the female reproductive unit of the flower that consists of a pollen-receptive tip known as stigma, style, and ovary. The sticky nature of the stigma hydrates the pollen grains which provide adequate conditions for pollen germination. This is the difference between stamen and pistil.

Reference:

1.'Androecium: Definition & Concept',Study.com, Available here
2.'Gynoecium: Definition & Concept'Study.com, Available here

Image Courtesy:

1.'Lilium longiflorum stamen'By JJ Harrison - Own work, (CC BY-SA 3.0) via Commons Wikimedia
2.'Blossom Pistil Red Flower Bloom Hibiscus' by Nikon D5200 via Max Pixel

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