Difference between Fragmentation and Regeneration

The key difference between fragmentation and regeneration is that fragmentation involves the splitting of fragments of an organism which ultimately creates a new organism. This process, as a method of asexual reproduction, has both advantages and disadvantages altogether. Whereas the regenration is a repairing of the cells, organs, tissue, etc.

Regeneration Vs Fragmentation

To study the complete mechanism and difference between fragmentation and regeneration, you should check the table below.

Differences between Fragmentation and Regeneration

Fragmentation	Regeneration
Each fragment that breaks can grow into a new organism.	The process occurs when an organism's lost limb or any other body part regrows whenever it gets cut off.
A completely new organism arises from each broken fragment.	No new organism is developed; only a part of the existing organism grows.
Few organisms can break fragments of their body and result in new organism creation.	All organisms show their regeneration capability to only some extent.
This process is possible only in those organisms which have a simple body structure and are unicellular.	This form of reproduction occurs only in organisms having complex body structures and are multicellular.

Fragmentation does not utilize specialized cells to multiply.	To regrow a body part, the process needs a special set of cells that helps in the proliferation and formation of a cluster of cells. This ultimately creates different combination of cells required for growth.
Only observed in invertebrates.	This type of reproduction is seen in invertebrates along with vertebrates.
The process can occur naturally or due to the predator's activity because it highly depends upon the complexity of the structure of an organism.	This reproduction is visible in almost all living creatures and is a result of damage to any specific body part.
Examples of fragmentation include parasite like sponges and platyhelminth like flatworms.	Some regeneration illustrations are: The lizard's tail (Please note If lizards lose their hindlimb or forelimb, the regrow process does not occur) Octopi arms Regrowth of human blood vessels

Fragmentation and Regeneration

In this portion, you will get to know the major differences between regeneration and fragmentation that occur in diverse organisms. Requires only one parent, both male and female are not required for this reproduction process. The cycle is easily accomplished, starting from the parent's organism body which forms pieces, grows, and transforms finally into a new organism.

Fragmentation in Plants and Animal

Fragmentation ccurs in fungi, cyanobacteria, sponges, sea stars, plants. In plants, fragments get carried away by natural sources like air, water, etc, which land in a suitable environment and grow into a new sapling.

Benefits of Fragmentation

- The method of reproduction completes in a very short period of time.
- Being an asexual reproduction process occurs too fast.

- From only one single parent, an entirely new era of similar organisms is being formed.
- This form of reproduction can take place in any climatic conditions and habitat.

Fragmentation Plant

- Vegetative or asexual reproduction is a form of fragmentation that occurs in plants.
- Plants form young seedlings on the leaves; which get separated to become selfdependent plants, for example, organs like turions and bulbils.
- The method is common in plants that lack blood vessels or are nonvascular, including mosses varieties.
- It also occurs artificially by methods like layering, cutting, grafting, and division using organs like tubers, rhizomes, and corms.

Fragmentation Animals

- Take place naturally in annelids, flatworms, and sponges.
- It is of two types Paratomy and Architomy.
- During Architomy, fragments of an organism split into 2 parts, and both have their own tissues and organ system.
- In Paratomy, two fragments grow as separate organisms positioning their body direction in a headtotail manner.

Regeneration in Plants and Animals

Restore or repair complete body parts, organs, cells, or tissues that are lost or have been injured. Jellyfish replace missing body parts but reconstructing their remaining tissues. Some like lizards replace missing body parts by growing specialized buds of cells known as blastema.

One process is compensatory hypertrophy. For example, the liver of a human. If a specific organ’s part gets eliminated, the leftover part develops to its actual size so that there is no interference in the functioning of the organ.

Similarities between Fragmentation and Regeneration

Though the main similarity between these two processes is that they are a part of reproduction, variation arises in how the process occurs in any organism. The main disadvantage of fragmentation is it results in biodiversity loss as the same individual copies are being produced.

The variation in genes does not occur in fragmentation but in regeneration, it does. A similar type of gene quality, and features, of a parent, are developed in the offspring. All the copies of the parent would inherit the same cons. For instance, if a parent organism is dealing with a disorder, the same will be transferred to the new generation.