

Difference Between Haplontic and Diplontic Life Cycles

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Key Difference – Haplontic vs Diplontic Life Cycles

In the context of biology, a biological life cycle is a sequence of changes a particular organism undergoes through means of [reproduction](#) (sexual or asexual) which finally returns to the original starting phase. This procedure differs from one organism to the other. During sexual reproduction, the life cycle includes the change of ploidy; the alternation of [haploid \(n\) and diploid \(2n\)](#) stages. [Meiosis](#) occurs during the change over from a diploid stage to a haploid stage. With regards to change of ploidy, life cycles are of three types. They are, haplontic, diplontic and haplodiplontic. **In a haplontic life cycle, the haploid stage is typically multicellular and results in the formation of a diploid (2n) cell, which is a [zygote](#). The zygote undergoes meiosis, which results in the formation of haploid (n) cells. In a diplontic life cycle, the diploid stage is typically multicellular, and meiosis occurs during [gamete](#) formation which results in the production of haploid (n) gametes. During fertilization, the haploid (n) gametes fuse together in the formation of a diploid (2n) zygote, and it mitotically divides and produces a multicellular diploid (2n) organism.** This is the key difference between haplontic and diplontic life cycles.

What is a Haplontic Life Cycle?

Haplontic life cycle involves the formation of a haploid (n) single cell by the meiosis of a diploid (2n) zygote. This phenomenon could be explained with sporic meiosis – the process of formation of spores. In this process, the zygote mitotically divides and produces multicellular [sporophyte](#) which is diploid (2n). Within the sporophyte, meiotic cell division occurs and results in haploid (n) spores. The spores undergo mitosis and develop haploid (n) gametes together; this is referred to as the [gametophyte](#). The gametophyte leads to the formation of gametes via [mitosis](#).

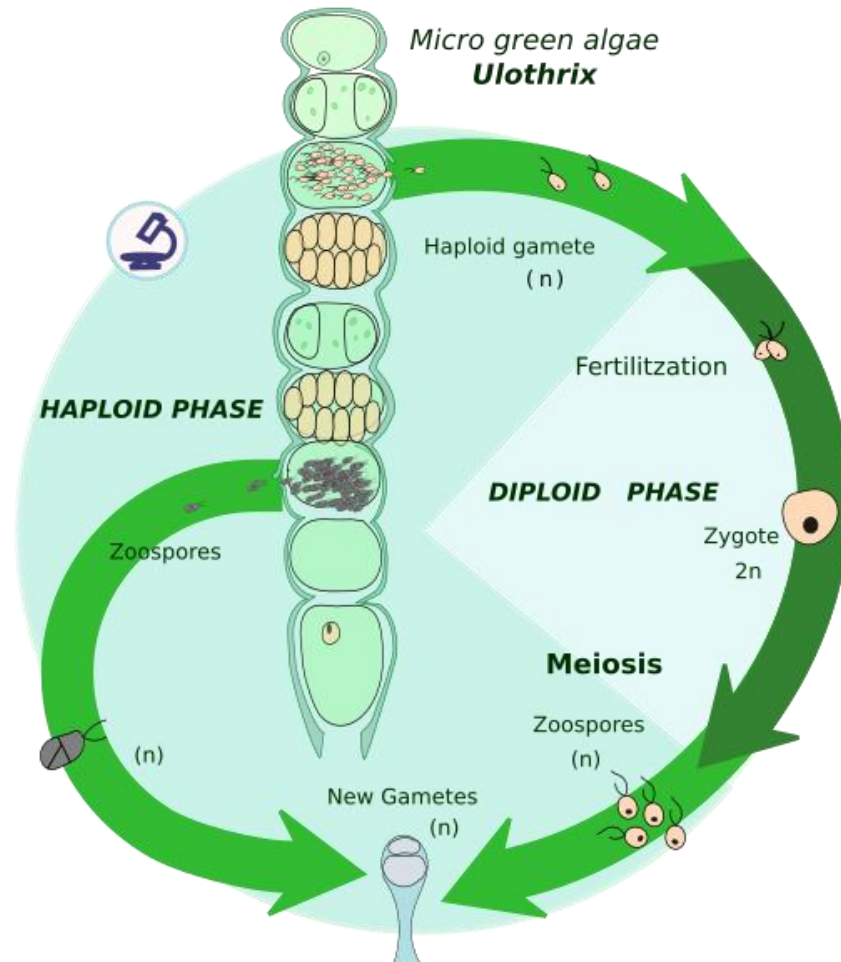


Figure 01: Haplontic Life Cycle of Algae

In haplontic life cycle, the zygote is the only diploid ($2n$) stage, and mitosis occurs only in the haploid (n) phase. Since individual haploid (n) cells are formed by mitosis, this life cycle is referred to as haplontic life cycle. This includes the life cycles of many [protozoa](#), all [fungi](#), and some [algae](#) types.

What is a Diplontic Life Cycle?

During gamete formation, meiosis takes place in the formation of haploid (n) gametes. Haploid gametes are produced from individual cells of the diploid cells through meiosis. These haploid gametes do not undergo mitosis, and they do not develop into an organism. Instead, they fuse with gametes of the opposite sex and produce a diploid cell which is known as a zygote. The diploid ($2n$) zygote then develops mitotically into a diploid ($2n$) organism. In the diplontic life cycle, the only haploid cells are the gametes. Meiosis only takes place in the diploid phase. Since the multicellular diploid individual is a diploid and the gamete undergoes meiosis, it is called a diplontic life cycle.

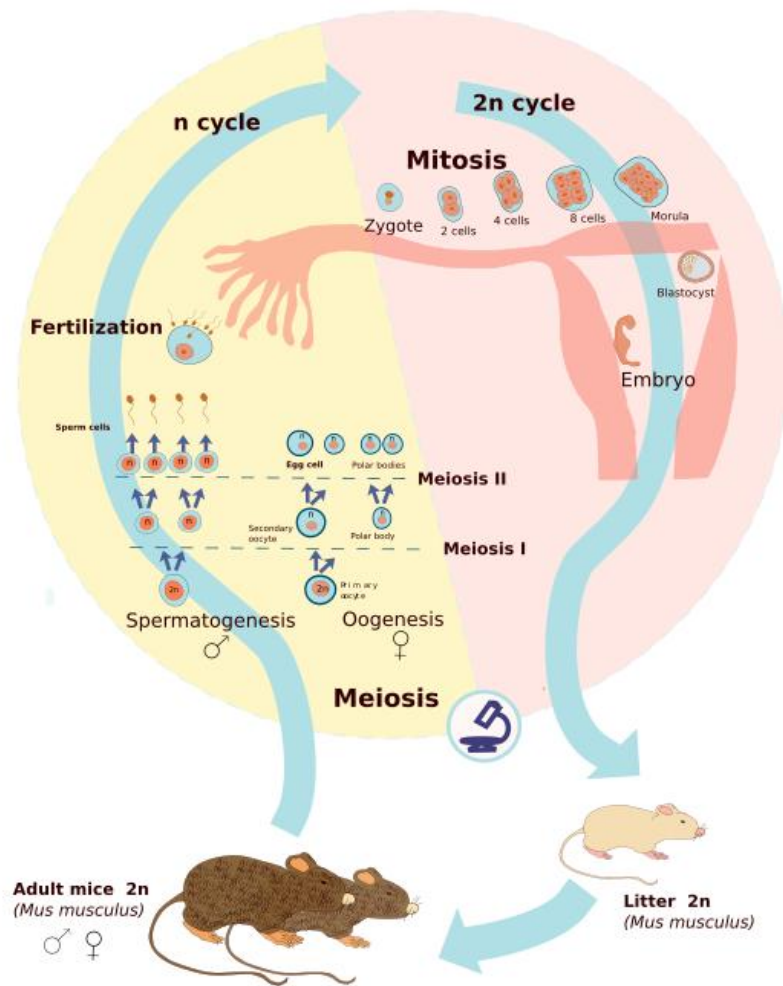


Figure 02: Diploic Life Cycle

What are the similarities between Haplontic and Diploic Life Cycles?

- Haplontic and diploic life cycles are involved in the formation of gametes and development of a new organism.
- Meiosis and mitosis occur in both cycles.

What is the difference between Haplontic and Diploic Life Cycles?

Haplontic vs Diploic Life Cycles

In haplontic life cycle, mitosis occurs in the haploid (n) phase which is

In diploic life cycle, the diploid stage is typically multicellular, and meiosis occurs

multicellular, and the diploid (2n) stage is the zygote which undergoes meiosis.	during gamete formation which results in the production of haploid (n) gametes and fuse to form a diploid (2n) zygote.
Mitosis	
Mitosis takes place in the haploid (n) phase in the haplontic life cycle.	Mitosis takes place only in the diploid (2n) phase of diplontic life cycle.
Examples	
All fungi, some varieties of algae and many protozoans have haplontic life cycles.	Animals and few brown algae have diplontic life cycle.

Summary – Haplontic vs Diplontic Life Cycles

A biological life cycle is referred to as the series of events that take place within a particular organism through means of sexual or asexual reproduction which finally returns to the original starting phase. The life cycles differ with regards to different species. Alternation of generations takes place within a life cycle of a plant. In sexual reproduction, change of ploidy is of three types; haplontic, diplontic and haplodiplontic. In haplontic life cycle, mitosis occurs in the haploid (n) phase which is multicellular, and the diploid (2n) stage is the zygote which undergoes meiosis. In diplontic life cycle, the diploid stage is typically multicellular, and meiosis occurs during gamete formation which results in the production of haploid (n) gametes and fuse to form a diploid (2n) zygote. This is the difference between haplontic and diplontic life cycle.

References:

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2. Gilbert, Scott F. "Plant Life Cycles." Developmental Biology. 6th edition. U.S. National Library of Medicine, 01 Jan. 1970. Web. [Available here](#). 14 Aug. 2017.

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