

Alternation of generation in bryophytes

The life cycle of a bryophyte comprises of two generations (gametophytic and sporophytic generation) which repeatedly follows one another. The gametophytic generation resembles the thallus body (gamete producing generation). The sporophytic generation resembles the sporophyte (spore producing generation). Both the generations alter each other and complete and continue the life cycle of a bryophyte.

The life-cycle of a bryophyte shows regular alternation of gametophytic and sporophytic generations. This process of alternation of generations was demonstrated for the first time in by Hofmeister (1851). Thereafter, Strasburger (1894) could actually show the periodic doubling and halving of the number of chromosomes during the life-cycle.

The haploid phase (n) is the gametophyte or sexual generation. It bears the sexual reproductive organs which produce gametes, i.e., antherozoids and eggs. With the result of gametic union a zygote is formed which develops into a sporophyte. This is the diploid phase ($2n$). The sporophyte produces spores which always germinate to form gametophytes.

During the formation of spores, the spore mother cells divide meiotically and haploid spores are produced. The production of the spores is the beginning of the gametophytic or haploid phase. The spores germinate and produce gametophytic or haploid phase. The spores germinate and produce gametophytes which bear sex organs.

Ultimately the gametic union takes place and zygote is resulted. It is diploid ($2n$). This is the beginning of the sporophytic or diploid phase. This way, the sporophyte generation intervenes between fertilization (syngamy) and meiosis (reduction division); and gametophyte generation intervenes between meiosis and fertilization.

In bryophytes, where the two generations are morphologically different, the type of alternation of generations is known as heteromorphic.

In the case of bryophytes the gametophyte generation is conspicuous and longer-lived phase of the life-cycle in comparison to that of sporophyte generation. Here, the gametophyte is quite independent whereas the sporophyte is dependent somehow or other on the gametophyte for its nutritive supply. The gametophyte gives rise to sporophyte and sporophyte to the gametophyte and thus there is regular alternation of generations.

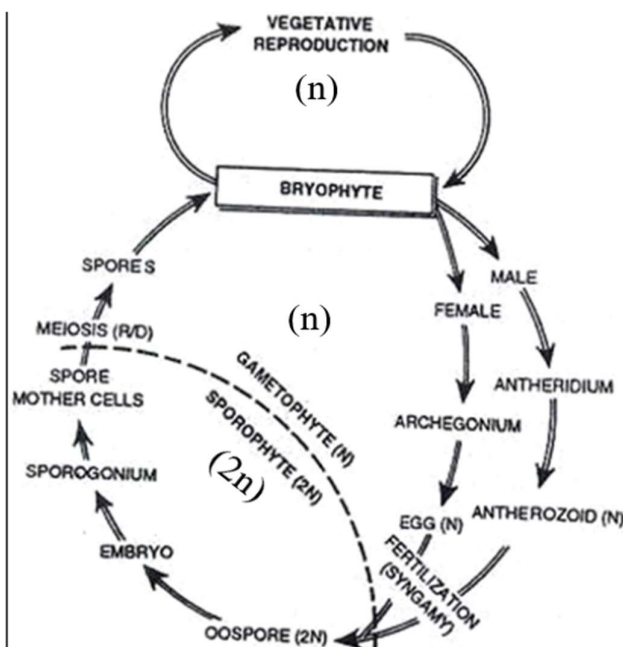


Fig: Phases in alternation of generations