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Heterospory and Seed Habit

Heterospory is a condition of the production of more than one type of spores in a single plant. These two types of spore differ in their formation, structure, functions and Sexuality. These two types of spores are called as Microspores and Megaspores.

(i) Microspores : Microspores are small sized spores produced in large numbers inside the microsporangium. They are male spores which on germination produce male gametophyte

(ii) Megaspores : Megaspores are comparatively large spores produced in limited numbers (1 to 4) inside the megasporangium. They are female spores which on germination produce female gametophyte.

The production of two types of spores with different sexuality was first evolved in Pteridophytes. But, the heterospory is now represented only by eight living species of Pteridophytes, like - Selaginella, Isoetes, Marsilea, Salvinia, Azolla, ~~Pilularia~~ Pilularia, Regnellidium and Platyzoma.

Heterospory in Selaginella

Selaginella, illustrates an example of heterosporous pteridophytes that approach seed habit because of the following notable characteristics.

(a) It is heterosporous.

(b) The megaspore starts germination within the megasporangia and their time of release from the megasporangia varies with species.

(c) The number of megaspores in S. rupestris and S. monospora is reduced to one.

(d) In S. rupestris the megaspore is never shed and fertilization and development of the embryo takes place while the megaspore is still within the megasporangium, which retain its connection with the parent plant. This condition can be linked with the viviparty in some angiosperms.

Heterospory leads to seed habit but fail to develop seeds because of the following shortcomings.

(a) They have no protective structures like the integuments surrounding their megasporangia.

(b) The permanent retention of megaspores within the megasporangia is not established

(c) Histological union between the megaspore and the megasporangium is absent.

(d) Lack of resting period after the development of embryo.

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The characteristic shown by seed plants which are assumed to have led to seed formation are —

(i) Heterospory
(ii) Reduced size of male gametophyte
(iii) Presence of a single megaspore within megasporangium.
(iv) Presence of protective integumental coat around the megasporangium.
(v) Retention of megaspore permanently within megasporangium.
(vi) Fusion of wall of the megaspore with megasporangium wall.

Importance of Heterospory

(a) The most important aspects of heterospory is that it is an expression of a sex determining process of the plant. In heterosporous individuals sex can be determined in their sporophytic phase during sporogenesis ie, during the formation of microspore and megaspores.

(b) Heterospory is the most important evolutionary development in Pteridophytes because it has ultimately led to seed developments. It is a pre-requisite to seed habit.

(c) Heterospory has brought about a number of changes in the characteristic of spore development which is the pioneer characters of seed habits in higher plants.