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| **FLORAL MODIFICATIONS**  **Bisexual flower**  Flowers which have both sexes  ***Perfect*** flowers are bisexual, bearing stamens and a pistil in the same flower structure, but one of these essential organs is absent in ***Imperfect*** or unisexual flowers. Most crop plants have perfect flowers, for example, wheat, oat, barley, rye, rice, sorghum, cotton, flax, potato, tobacco, sugar beet, sugarcane, soybean, common bean, tomato, common forage and turf grasses, and forage legumes. Imperfect flowers may be *staminate*, bearing stamens but no pistil, or *pistillate*, bearing a pistil but without stamens. The corn plant has staminate flowers in the tassel and pistillate flowers on the shoot. In castor and wild rice, pistillate flowers are commonly borne in the upper portion of the floral structure and staminate flowers in the lower portion. Crop plants in which staminate and pistillate flowers are borne on the same plant, as in corn, cassava, squash, or castor, are ***monoecious*** (Fig. 2.4); plants in which the staminate and pistillate flowers are borne on different plants are *dioecious* (Fig. 2.5A and B). Hemp, hops, buffalograss, papaya, and asparagus are species with dioecious flowers, although occasional hemp or papaya plants may produce monoecious flowers. Imperfect flowers are always incomplete. Some incomplete flowers, such as occur in the grasses or in buckwheat, are perfect because both the stamens and a pistil are present in the same flower although petals or sepals may be missing.  **Unisexual**  Flowers having only one sex e.g tessel of maize plant  Unisexual flowers are further divided into monoecious and dioecious  **Monoecious:** two different kinds of flowers pistilate and staminate flowers are present on the same plants at different locations  **Dioecious:** male and female flowers (pistilate and staminate flowers) are present on different plants. Hence these plants are named as male and female plants. E.g. date palm.  **Hermaphrodite flower**  Both male and female reproductive parts e.g stamen and pistil are present in the same flower of the plants.  Hermaphrodite plants are subdivided into following categories   |  |  |  | | --- | --- | --- | | **Dichogamous**  Stamens and pistil mature at different times | **Homogamous**  Stamen and pistil mature at the same time | **Heterogamous**  Self-pollination is impossible due to relative position of stamen and pistil | | 1. **Protandrous**   Stamen mature first than stigma | **a-Cleistogamous**  First pollination occurs then flower opens e.g cotton and barley | **a-Homostylus**  same length of stamen and pistil but direction may be opposite | | 1. **Protogynous**   Stigma matures first than the stamen | **b-Chasmogamous**  First flower opens then pollination occur | **b-Hetrostylus**  Stamen and pistil are of different length. Usually stamen is in reduced form |   Plants can be self-pollinated **(Autogamous)**  Transfer of pollen grain from the stamen of a flower to the stigma of same flower  Or they can be cross pollinated **(Allogamous)**  Transfer of pollen grain from the stamen of a flower to the stigma of some other flower of different genotype.  Pollination is completed in different ways so types of pollination is named accordingly  **ENTMOPHILOUS:** Pollination is carried out with the help of insects **ANIMOPHILOUS:** Pollination is carried out with the help of wind **HYDROPHILOUS:** Pollination is carried out with the help of water **ZOOPHILOUS:** Pollination is carried out with the help of animals |