Pattern of Inheritance and Dihybrid Genetics of Brassica rapa

Farris, Ashlyn (School: Home School)

Without being able to predict the pattern of inheritance much time would be lost to trial and error as well as the product and seed being wasted. The ability to trust that you will get the phenotypes you are expecting is important when attempting to create a new cultivar. This project has explored the genetics and breeding of rapid-cycling Brassica rapa and found a pattern of inheritance that can be tested and analyzed. The hypothesis that when a parental generation is bred with like phenotypes the filial generation will show phenotypes in a ratio of 9:3:3:1 was tested and analyzed. A Punnett square was developed and the expected ratio of phenotypes were found. The Brassica rapa plants were bred together in stabilized conditions and the resulting filial generation's phenotype ratio was analyzed using chi-square analysis. The ratio of the filial generation was found to be 4:1:6:0, when compared to the expected ratio of 9:3:3:1 the deviation of the observed phenotypes was found to be due to chance and was accepted. This study found that rapid-cycling Brassica rapa will produce plants with a ratio of phenotypes in the form of 9:3:3:1 when two plants with the same phenotypes were bred together. Further experiments could find the ratio of when plants with different phenotypes are bred together.

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