

Mendelian Law

Gregor Mendel (1822–1884) was an Austrian monk and botanist whose selective breeding of plants, during the 1860s, led to the realization of hereditary transmission of characteristics based on dominant and recessive characteristics (Lewin and Foley, 2004). In this Mendel established the rules of inheritance (the “laws of Mendelian inheritance”) but his work remained unknown until it was rediscovered in 1900. Mendel was engaged at cross-pollinating pea plants and discovered that physical traits are reflected in subsequent generations due to stable inheritance factors (now known to be genes). He also came to the realization that each plant has two inheritance factors for each trait that come from the contributing male and female parent plant. These two can either be the same or different. When they differ one may be dominant, or determining of the manifestation of the trait, and the other recessive. The recessive would only manifest its character when paired with the same recessive characteristic from the other contributing parent plant. Furthermore, he realized that the recessive trait may continue to exist even though not manifest in the phenotype (the observable characteristic) which is why a characteristic may reappear in later generations.

In his experimental studies Mendel took strains of peas that differed in some characteristic that was constant and clearly delineated (Trocchio, 1991). These characteristics included seed shape—smooth or wrinkled, color of seed skin, pod shape, pea color—green or yellow, plant height—short or tall, and distribution of flowers—bunched together or spread out. From these he created hybrids that had a characteristic that appeared in it. He then allowed the hybrids to fertilize themselves and assessed the progeny. Seventy-five percent resembled the hybrid parent, the rest the original parent. Extending the procedure across a number of generations he was able to mathematically describe the inheritance patterns and distinguish dominant and recessive characteristics. Contrary to earlier thinking, Mendel was able to demonstrate that the characteristics of each parent did not fuse in their offspring but remained separate and could be carried over generations (Plotkin, 2004).

Visit <http://arstechnica.com/science/2010/04/breaking-mendels-laws-the-value-of-informative-errors/> for a greater explanation of Mendel and modern assessments of his research.

References

- Lewin, R. and Foley, R. A. (2004). *Principles of human evolution* (2nd ed.). Malden, MA: Blackwell.
- Plotkin, H. (2004). *Evolutionary thought in psychology: A brief history*. Malden, MA: Blackwell.

Trocchio, F. D. (1991). Mendel's experiments: A reinterpretation. *Journal of the History of Biology*, 24, 485–519.