SHORT COMMUNICATION

DID MENDEL CHEAT?

Faraz Ahmed Bokhari* , Waqas Sami
Department of Physiology and Cell Biology* & Department of Medical Education, University of Health Sciences Lahore.

Who does not know Gregor Mendel? Mendel is considered to be the father of genetics. The often stated irony is that Mendel's work, at the time of presentation of his famous paper titled 'Experiments in plant hybridization', was not taken seriously. It would be later, the year 1900, that a few botanists would 'rediscover' Mendel's work and the field of genetics would find its place at the center of human curiosity. What Mendel might not have envisaged is that his scientific inferences would be questioned on scientific, and even moral grounds.

The main arguments indicting Mendel and his work, started to brew when world renowned mathematician and statistician, R. A. Fisher, discovered peculiarities in Mendel's data. Fisher, who in the words of Anders Hald[1] "was a genius who almost single-handedly created the foundations for modern statistical science", while lecturing at Cambridge in 1911 quipped: *It is interesting that Mendel's original results all fall within the limits of probable error; if his experiments were repeated the odds against getting such good results is about 16 to one. It may have been just luck; or it may be that the worthy German abbot, in his ignorance of probable error, unconsciously placed doubtful plants on the side which favored his hypothesis.* [2]

Fisher in 1936 gave a detailed statistical analysis of Mendel's data. Fisher found the reported and expected ratios of segregating traits, that Mendel had reported, to being unusually good. His famous "too good" phrase stimulated scientists to address this issue.

Fisher's famous final verdict was: *The data have evidently been sophisticated systemically, and after examining various possibilities, I have no doubt that Mendel was deceived by a gardening assistant, who knew too well what his principal expected from each trial made.* [2]

One of Fishers pupils, A.W.F. Edwards, now retired Professor of Biometry at the University of Cambridge, has also written on the subject. In one of his papers examining Mendel's work, he defends Fisher: *…his (Fishers') painstaking analysis and his defense of Mendel's integrity have sometimes been incorrectly reported as having exposed a scientific fraud of major proportions, and the name of Mendel is in danger of acquiring the connotations of Piltdown or Burt.*[2]

In his very elaborate analysis, Edwards did find some problems with Fisher's techniques, the main being whether Fisher was using Mendel's expectations or natures'. Yet his overall conclusion is that *"Fisher's suggestion that the data have been subjected to some kind of adjustment must stand"* and that *"Mendel's results really are too dose"*[2]. A.H. Sturtevant (1965) is also of the opinion that *"Fisher's analysis of Mendel's data must stand as he stated it"*[3].

Of course, there are others who aggressively defend the scientific and moral standing of Mendel[3,4,5]. It may come as a surprise that this aspect of Mendel's work is very much alive and debated all over the world in selected circles.

Our objective of presenting this work is not to evaluate the intricacies of statistics that Mendel used. Our aim is to show that even legends like Mendel (and also Charles Darwin) have been the topic of controversial debate in the advanced world. Their scientific work has been subjected to regular criticisms, revisions, and even moral accusations. We, as a nation, should also be open-minded about critique of our work and of others, as this rich, rigorous debate forms the basis of discoveries.

As far as Mendel's work is concerned, in case of reasonable doubt, we believe, that the benefit of the doubt
should be given to the man who dedicated his life to the cause of science.

REFERENCES

1. Hald A. A History of Mathematical Statistics from 1750 to 1930. Wiley, New York, 1998.
2. Edwards AW. Are Mendel's results really too close? Biol Rev Camb Philos Soc. 1986;61(4):295-312.
3. Novitski E. On Fisher's criticism of Mendel's results with the garden pea. Genetics. 2004;166(3):1133–1136.
4. Novitski CE. Revision of Fisher's analysis of Mendel's garden pea experiments. Genetics. 2004;166(3):1139–1140.
5. Weiling F. What about R.A. Fisher's statement of the "too good" data of J.G. Mendel's Pisum paper? J Hered. 1986;77(4):281-283.

Address for correspondence: Dr. Faraz Ahmed Bokhari, Department of Physiology and Cell Biology, University of Health Sciences Lahore.
E-mail: drfarazbokhari@yahoo.com