MENDELISM: CONNECTING THE DOTS ACROSS CENTURIES

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The year 2022 paid a bicentennial tribute to the phenomenal work of the father of Genetics, Gregor Johann Mendel for deciphering the genetic logic behind the phenotypes. His principles were distilled as the law of segregation and law of independent assortment. His work was rediscovered 34 years later by H. De Vries, C. Correns, and E. Tschermak and popularized by W. Bateson. While C. Darwin accounted for similarities among organisms through the differences in the form of evolution, G. Mendel accounted for similarities through heredity; the ideological gaps were bridged mathematically by R. Fisher. Later with the test of time, the interaction among researchers paved Mendelian principles into different branches of genetics viz., cytogenetics, molecular genetics, population genetics, quantitative genetics, etc. At present we have landed in the era of genomics and the emerging field of phenomics which have potential to bridge the huge gap between demand and supply in different agro-industrial and allied goods. In order to connect the budding researchers in the field of genetics with Mendelism and its significance, catalyzed our concentrated effort to link Mendelism across the centuries, highlighting its importance and extrapolating the concept of heredity and variation from garden peas to different life forms. In conclusion, as our knowledge on genetics deepens, more insights on underlying mechanisms and subsequent applications will be witnessed.

Key words: *Chromosome, Darwin, DNA, Evolution, Gene, Genetics, History, Mendel, Variation.*

МЕНДЕЛІЗМ: ВСТАНОВЛЕННЯ ЗВ'ЯЗКІВ МІЖ СТОЛІТТЯМИ

2022 рік віддав данину 200-річчю феноменальної роботи батька генетики, Грегора Йоганна Менделя, щодо розшифрування генетичної логіки фенотипів. Квінтесенцією його принципів були закон розщеплення та закон незалежного успадкування. Тридцять чотири роки по тому його роботу було заново відкрито Гуго де Фрізом, К.Е. Корренсом, Е. Чермак та популяризовано В. Бетсоном. У той час як Ч. Дарвін пояснював подібності між організмами відмінностями в формі еволюції, Г. Мендель пояснював подібності спадковістю; ідеологічні прогалини були математично заповнені Р. Фішером. З часом взаємодія між дослідниками проклала шлях менделевським принципам у різні сфери генетики, зокрема, цитогенетику, молекулярну генетику, популяційну генетику, кількісну генетику тощо. Наразі ми потрапили в еру геноміки й нової галузі, феноміки, потенціал яких дозволяє заповнити величезну прогалину між попитом і пропозицією щодо різних агропромислових та суміжних товарів. Щоб поєднати дослідників-початківців у сфері генетики з менделізмом та пояснити його значимість, ми зосередили свої зусилля на відстеженні менделізму протягом століть, підкреслюючи його важливість та екстраполюючи концепцію спадковості й мінливості на прикладі посівного гороху на різні форми життя. Зрештою, з поглибленням наших знань щодо генетики ми побачимо краще розуміння основних механізмів та відповідних способів практичного застосування.

Ключові слова: хромосома, Дарвін, ДНК, еволюція, ген, генетика, історія, Мендель, мінливість.

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