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RECOLLECTION

The story of geneticist Hsien-Wen Li

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Hsien-Wen Li (1902–1976) is a distinguished geneticist and agricultural breeding specialist, and a significant figure in modern biology and agriculture development in China. He was born to a peasant's family in Jiangjin county, Sichuan Province, whose ancestors were Hakka (Kejia) people from Guangdong Province. Hence, He possesses the characteristics of farm boy, diligence and frugality, as well as of Hakka group, fortitude and persistence. Hsien-Wen Li called himself as "a simple and serious countryman"; while he and Ju-chi Li, Ching-Chun Li, Ching-Hsiung Li together are honored "Four Mars" in genetics area during Republic era.

At 1915, Hsien-Wen Li attended Tsinghua school (the predecessor of Tsinghua University) in Beijing and started his academic journey. Due to the young age, he was not very studious at the first six years in Tsinghua, and did not get good scores on basic courses, such as mathematics and physics. Until he chose agriculture as major at 1921, two years before graduation, he began to work hard and got significant improvement in academic studies. He felt very regretful about this experience—he believed that he would accomplish more if he had thorough knowledge of physics and mathematics. During the eight years of Tsinghua study, he was deeply impressed by the heuristic teaching mode. Words from the agrology teacher, "breeding is the most popular subject in modern science", inspired him to continue the career on genetics and breeding.

After graduating from Tsinghua, Hsien-Wen Li went to the United States for graduate study. Initially He studied horticulture at Purdue University, but he felt the courses were too simple and contained limited theoretical knowledge. Therefore, three years later, he transferred to Cornell University to work on genetics. His advisor was a renowned plant geneticist, Prof. Rollins A. Emerson, who was also Chair of Department of Plant Breeding and Dean of Graduate School. He made rapid progress on academic studies under the instructions of many reputable teachers. For example, the cell biology teacher Bababra McClintock, who won the Nobel Prize in Physiology or Medicine at 1983, used direct and vivid teaching style to provide valuable assistance to young students; when he worked as an assistant for Prof. Randolph, he not only learned a lot of experimental techniques, but also strongly felt the significance of experiments in biological science. During the graduate study, Hsien-Wen Li benefited a lot from the personal influence of Prof. Emerson, who tirelessly worked with young students in cornfields and investigated scientific puzzles through careful experiments and cautious thinking. He regarded Prof. Emerson as an example and followed his advisor's step during the rest of his life. At the same time, Hsien-Wen Li became a good friend with some American classmates, including G.W. Beadle, M.M. Rhoades and G.F. Sprague, who all became Academician of Academy of Science in United States, among which George W. Beadle also won Nobel Prize in 1958. In the comfortable academic environment, Hsien-Wen Li's research went well and earned his Ph.D. degree at 1929.

After graduate study, Hsien-Wen Li started to plan his return to China. Before the trip, he visited the breeding expert Prof. Love and hoped to learn techniques on plant breeding. Unexpectedly, Prof. Love showed little interest in Hsien-Wen Li's will to do applied research, because he thought Hsien-Wen Li knew only the theory of genetics. Despite the frustration, Hsien-Wen Li was still full of confidence and left US. However, the reality in China was more than tough—it was extremely hard to find a job and it was very complicated to deal with academic affairs. Some returnees, with or without Ph.D. degree, were able to get full professorship; while he was offered only a position of assistant professor at Central University in Nanjing, teaching sericulture courses with low payment, and soon he lost the work. Later, he found a position of professor at Northeastern University in Shenyang, but it was quickly lost due to the invasion of Japan. He even went back to Tsinghua University to be a sport tutor for a while. In front of the difficulties from both country and himself, he never gave up or submitted to the situation. In August 1931, he went to Nanking University to visit his Cornell teacher, Prof. Love and Prof. C.H. Myers. At that time, Prof. Love was Consultant of the Department of Industry and Chief Technician of Central Agriculture Research Institute in China. During the talk, Prof. Myers said that Hsien-Wen Li was just a genetics theorist dealing with genes on chromosome, but not as an application

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researcher capable of make profits for the country. Facing this unfair statement, Hsien-Wen Li argued, "I will definitely show you when there is a chance."



With the assistance of colleagues and friends, Hsien-Wen Li joined Henan University at 1932 and then moved to Wuhan University, where he became Chair of Agriculture Department. Since then, he started working on millet and wheat breeding. Soon he made significant progress on millet breeding and published several papers on US agriculture journals; he was even called "millet expert" or "bristlegrass expert". At Wuhan University, he discovered tetraploid in pearl millet, and his daughter was named "Siyuan" (the Chinese name of tetraploid) for memory.

During the Resistance Against Japanese War of 1937–1945, Hsien-Wen Li summarized his research about genetics and evolution of millet, and indicated that bristlegrass is the predecessor of millet in Chengtu (Chengdu) city, Sichuan Province. Later, he worked with Ching-Hsiung Li and Wen-Kui Pao to investigate the polyploidy induction in Euphorbis, distant interspecific hybridization and evolution of millet, and genetics analysis of wheat dwarf characters. They got significant achievements, with over 10 publications on international genetics journals. Due to the war, the research condition was extremely tough. Once he mailed a 25-page manuscript to an American journal and was asked to pay $70 publication fee. He replied that he was too poor to afford that, and even if he had the money, he was not able to mail it out at all. Finally, the fee got waived. The improved species was applied to Mianyang at Northern Sichuan in large scale and produced 10%–20% higher yield. This had significant impacts on enhancing the food production, which partially realized his childhood dream of "work for the country, enhance grain production". In addition, he was also the pioneer on corn inbred breeding studies.

In the mid-1940s, Hsien-Wen Li went to US with an academic group to study agriculture, and returned to the mother school Cornell after 15 years. When he presented his research, Prof. Love showed great surprise. Comparing to the work of Prof. Love and his colleagues during the 11 years in China, Hsien-Wen Li accomplished much more achievements within these short few years. Unfortunately, Prof. Myers had passed away and was not able to see such a miracle. At 1948, Hsien-Wen Li was elected to the Academician of Academia Sinica.

At 1948, Hsien-Wen Li was invited to Taiwan Sugar Company to be Manager of Scientific Research Department and Chair of Plant Institute of Academia Sinica. During that period, he devoted himself to the breeding of sugarcane, which was an extremely hard work. The clothes were easily cut by the sharp leaves of sugarcane, so did the skins. However, his motivation never faded in front of such difficulties. With the strong faith and passion, he got great success on sugarcane breeding and spread fine breed as well. At the first year of well-bred application, the sugar yield was enhanced to 880,000 tons from the original 550,000 tons, and this high yield remained stable in the following years. This achievement not only save the company, but also made significant contribution to Taiwan economy because 70% of foreign exchange at Taiwan relied on cane sugar export at that time. Therefore, he was also called "Sugar Li" by worldwide colleagues.

Although Hsien-Wen Li received Western education and peaked early, he still kept a simple lifestyle like a farm boy. He wore plain clothes and did not care for details; with strong body and dark skin, he was often mis-recognized as workers or peasants. Once, while he rested on the cane field, a person walking by took him for a worker in Sugar Company and asked how much he earned. After hearing about the high working load and low payment, the passerby showed great sympathy at once and suggested him to raise rabbits to make more money. This nice passerby even spent half an hour teaching him how to raise rabbits.

One of Hsien-Wen Li's wishes was reunion of "Four Mars"; however, he was not able to see this moment. He passed away at 1976 due to heart attack and left his legend and colorful stories to the following people.

REFERENCES

Li, H.W. (1970). Autobiography of Hsien-Wen Li. Taipei, Taiwan Commercial Press. (李先闻. (1970). 李先闻自传. 台北, 台湾商务印书馆.)

Li, H.W., and Pao, W.K. (1943). Evolution of Millets. Sichuan Agriculture Institute Bulletin 36, 1–17. (李先闻, 鲍文奎. (1943). 粟类之演化. 四川省农业改进所农业丛刊 36, 1–17.)

Pao, W.K., Li, C.H., Cheng, C.F., and Li, H.W. (1943). Genetics of wheat dwarf characters. Scientific Agriculture 1, 1–12. (鲍文奎, 李竞雄, 陈之万, 李先闻. (1943). 小麦矮生性之遗传. 科学农业 1, 1–12.)

(2008). Pursue excellence: eighty years of Academia Sinica. Taipei, Academia Sinica. (中央研究院八十年院史编纂委员会, 追求卓越: 中央研究院八十年. 台北, 中央研究院.)

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