Journal updates

EDITORIAL

Application of Artificial Intelligence (AI) in Plant Sciences Research

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© **The Author(s) 2021**   **Published online:** 10 October 2021

The current world needs to use modern technologies in plant science research due to increasing food requirements, and to cope up with global climate changes (1). Consequently, Artificial Intelligence (AI) based technologies are considered as the most recent and advanced research tools in every sector of science. Biological researches are also making progress surprisingly due to the assistance of AI affiliated tools directly or indirectly. Nowadays, plant physiology to genomic manipulation has witnessed, how it is easier and accurate than previous (2). Moreover, continuous monitoring of plants' growth, growing media, and relevant surroundings were time and labor-consuming in the past; even, the obtained results were erroneous somewhat. Data processing and analysis were based on individual performances of the participated researchers; surprisingly, the scenarios have been changed after the emergence of AI (3).

Now scientists are developing ideas and set up activities, and then combined these activities with specific AI-based programs to observe the final outcomes as simply as possible (4). Satellite-associated remote sensing in the crop fields and ocean to monitor crops yielding and algal bloom respectively are good examples of the applications of AI. This is more evident in AI-based indoor hydroponic production systems, where the nutrients supply and environment management are done automatically according to the needs of the growing organisms (5). Furthermore, gene identification, DNA sequencing, and genome editing of plants all are assisted by AI in many developed countries. Plant tissue culture also witnesses the assistance of AI in nutrient media management responsible with specific organism (6). Hopefully, in future plant genomics, alternative production systems to evolutionary plant biology research will see a tremendous change in their outputs due to the accurate and relentless analysis by AI or AI derived tools. Thus the risky researches will be solved since direct involvement of human beings will be avoidable. For example, the physical survey for new plants in oceans to steep mountains will be replaced by AI-based machines.

In conclusion, future research on all areas of plant science will embrace the positive aspects of artificial intelligence, which will make the findings more reliable than previous, and will assist the plant scientists to be up-to-date with concurrent outputs.

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REFERENCE

1. Ali S, Shafique O, Mahmood T, Hanif MA, Ahmed I, Khan BA. A review about perspectives of nanotechnology in agriculture. Pakistan J Agric Res. 2018;31:116–21.
2. Orozco-Arias S, Isaza G, Guyot R. Retrotransposons in plant genomes: structure, identification, and classification through bioinformatics and machine learning. Int J Mol Sci. 2019;20:3837.
3. Chegini GR, Khazaei J, Ghobadian B, Goudarzi AM. Prediction of process and product parameters in an orange juice spray dryer using artificial neural networks. Journal of Food and Engineering. 2008;84:534–43.
4. Wang Y, Li T, Jin G, Wei Y, Li L, Kalkhajeh YK, Ning J, Zhang Z. Qualitative and quantitative diagnosis of nitrogen nutrition of tea plants under field condition using hyperspectral imaging coupled with chemometrics. J Sci Food Agric. 2020;100:161–67.
5. Andrianto H, Suhardi, Faizal A. Development of smart greenhouse system for hydroponic agriculture. Information Technology Systems and Innovation International Conference. 2020; pp. 335-40.
6. Alanagh EN, Garoosi G, Haddad R, Maleki S, Landín M, Gallego PP. Design of tissue culture media for efficient *Prunus* rootstock micropropagation using artificial intelligence models. Plant Cell Tissue Organ Cult. 2014;117:349–59.