2020 Awards in the *Journal of Plant Research*

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Published online: 3 August 2020
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The Botanical Society of Japan honors excellence in publications of the *Journal of Plant Research* through the Best Paper Awards and the Most-Cited Paper Award every year. We are proud to announce this year's recipients.

Best Paper Awards

Seed priming is a treatment that controls seed water content to partially activate germination processes. It enhances seed performance, including germination, but sometimes reduces seed storability or longevity as a side effect. Naoto Sano and Mitsunori Seo from the RIKEN Center for Sustainable Resource Science screened chemicals that suppress seed deterioration under a controlled condition from 80 known biologically active compounds using *Arabidopsis thaliana* seeds (Sano and Seo 2019). They found that seeds primed with mimosine, a cell cycle inhibitor, retained higher survival rates after a controlled deterioration treatment compared to seeds primed without the chemical. They also found that other cell cycle inhibitors had similar effects on the seed storability after priming. Their results suggest that progression of the cell cycle during priming is an important checkpoint that determines the storability of seeds after the treatment. This study will contribute to development of optimal priming techniques to produce seeds with enhanced germination performance and acceptable longevity.

Akira Yamawo and Nobuhiko Suzuki from the Faculty of Agriculture, Saga University and Jun Tagawa from the Faculty of Informatics, Okayama University of Science studied functions of extrafloral nectary (EFN) in *Mallotus japonicus* (Yamawo et al. 2019). EFN-bearing plants attract ants to gain protection against herbivores. *Mallotus japonicus* has two types of EFNs, including a pair of large EFNs at the

leaf base and many small EFNs along the leaf edge. They hypothesized that the two types of EFN have different roles. Using well-designed manipulation experiments, they found that the small EFNs have had a greater effect than leaf base EFNs on ant dispersal on leaves. They also found that the extended foraging area of ants resulted in an increase of encounter or attack rate against an experimentally placed herbivore. They concluded that *M. japonicus* plants control the foraging area of ants on their leaves using different types of EFNs in response to leaf damage, thus achieving a very effective biotic defense against herbivores by ants. This study deepened our understanding of diversity in plant defense against herbivory.

Most-Cited Paper Award

The article by Akihito Fukudome from the Vegetable and Fruit Improvement Center, Texas A&M University and Toshiyuki Fukuhara from the Department of Applied Biological Sciences and Institute of Global Innovation Research, Tokyo University of Agriculture and Technology is one of the review articles collected for the JPR symposium entitled “Expanding plant non-coding RNA world” (Fukudome and Fukuhara 2017). Dicer is a double-stranded RNA (dsRNA)-specific endoribonuclease and plays an essential role in triggering both transcriptional and post-transcriptional gene silencing in eukaryotes. Unlike animals, which have only one or two Dicers, plants have at least four DCL proteins. In this review, they summarized and discussed the biochemical properties of these plant DCL proteins revealed by studies using highly purified recombinant proteins, crude extracts, and immunoprecipitates. This article contributes to deepening our mechanistic understanding of how RNA silencing is fine-tuned under various physiological circumstances in plants.

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