

Arabidopsis Biological Resource Center

<https://abrc.osu.edu/>

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Recent activities and newly developed tools and/or resources

In 2020 ABRC distributed close to 66,000 samples to 1,305 individuals located in 29 countries. We also provided bulk seed for 4,026 lines to NASC and an additional 3,809 individual samples of seed requested by NASC users. The seed collection is composed of over 500,000 stocks. *Arabidopsis thaliana* seed stocks include large populations of T-DNA, transposon insertion and TILLING mutants, individual well-characterized mutants, natural variants, recombinant inbred and mapping populations, transgenic reporter lines, and RNAi lines and pools. The collection also includes 513 seed stocks from 33 other members of the Brassicaceae. ABRC received donations of 860 seed stocks in 2020. Bulk seed for a further 1,061 seed stocks was received from NASC. Seed donations were mostly composed of characterized mutant lines and other members of the Brassicaceae.

The non-seed portion of the collection numbers over 400,000 stocks. These lines include individual clones and libraries from *Arabidopsis thaliana*, and other members of the Brassicaceae, as well as constructs, host strains, antibodies, cell lines and education resources. 23 non-seed resources were added to the collection in 2020, mostly vectors. ABRC has performed quality control testing for 3,497 new and existing stocks, involving either germination testing or verifying stock identity. ABRC outreach served more than 1,220 individuals in 2020 through participation in virtual community events, and collaboration with other STEM units on campus to provide a virtual teacher workshop series and bi-weekly STEM education office hours for educators. We have submitted a 5-year funding proposal to the National Science Foundation (NSF) to partially support the ongoing activities of the center.

Planned future activities

ABRC will continue to solicit donations of new resources with a particular focus on seed resources including multiple (stacked) *Arabidopsis* mutants and other members of the Brassicaceae. In collaboration with John Sedbrook and his team of researchers we will be curating, propagating, and distributing ca. 600 North American and ca. 350 European wild populations of *Thlaspi arvense* germplasm (Pennycress) as part of a recent award they received from Joint Genome Institute (DOE) to generate whole-genome sequence for these natural accessions. 500 pennycress EMS mutant lines will also be sequenced by the Sedbrook group and the stocks will be deposited with the ABRC.

Distribution of resources is expected to continue at or above 2020 levels. Quality control testing of new donations and stocks reproduced at ABRC will be carried out at similar levels to 2020. We plan to transition some plasmid stocks to Clonesaver cards to reduce time spent propagating and testing these resources. These cards stabilize DNA without the use of reagents and can be safely stored at room temperature for years. This will also facilitate international distribution as import of live cultures of *E.coli* is no longer permitted by several countries.

ABRC and NASC collaboration via exchange of seed stock resources and related data will also continue. ABRC outreach in collaboration with local community partners, the Ohio State University (OSU), and the broader plant science research and teaching communities will focus on improving accessibility in our programs and reaching new audiences. ABRC will also present a virtual booth at ICAR 2021.

Please provide a paragraph describing the general impact of the COVID19 pandemic on your activities

The COVID19 pandemic has had a significant negative impact on ABRC's activities as OSU and other research facilities across the world shut down or scaled back research efforts. OSU limited on campus activity from mid-March to early June. During this time, only three of eleven permanent staff members were permitted to continue to work on campus to carry out essential functions such as harvesting seed lines already growing in the greenhouse and maintaining cell cultures. We were also able to continue to fill orders during this period as demand dropped to less than 50% of normal levels.

Orders for the year were substantially reduced with approximately 30% fewer orders than 2019 and 60% fewer samples shipped. The largest impact was seen on orders from China which were down 60% overall for the year. The US and Canada saw a 30% drop in orders and most other countries a 15% reduction. Orders from Japan dropped only 10% in 2020 and Japan overtook China as the second largest consumer of stocks after the US. We have applied for supplemental funding from NSF to counteract the loss of income caused by the reduction in demand for stocks. It was also necessary to reduce staffing levels and raise stock prices in August 2020. As of March 2021, orders have still not returned to pre-pandemic levels and ABRC staff who are able to work from home continue to work remotely. In person outreach events have not yet resumed, but a several virtual events are planned.