

13th International Conference

AAGB-2025

ADVANCES IN ARACHIS THROUGH
GENOMICS AND BIOTECHNOLOGY

23rd-25th MARCH 2025 | NOVOTEL, CANDOLIM, GOA, INDIA

ABSTRACT BOOK



AAGB-01: Harnessing Genebank Diversity for Future-ready Crops

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Plant genetic resources for food and agriculture (PGRFA) play a vital role in ensuring sustainable agriculture and food security worldwide. The conservation of PGRFA is primarily through *ex-situ* genebanks, with approximately 7.4 million germplasm accessions stored in 1,750 genebanks globally. Notably, the 11 CGIAR genebanks conserve over 730,000 accessions of crop, forage and tree species, and are made available through the Plant Treaty's multilateral system. These resources are conserved at CGIAR genebanks and safety duplicated Svalbard Global Seed Vault and at one more genebank under long term storage condition. *Ex-situ* genebanks, that conserve PGRFA serve as vital repositories for preserving crop diversity. The ICRISAT genebank is one of the largest repositories in the CGIAR system and conserves over 131,000 accessions of 11 crops and their wild relatives. Among the 11 crops, groundnut is one of the important crops with 15393 accessions from 93 countries including 7484 landraces and 401 accessions of wild species. National genebank of India conserves 13893 accessions of groundnut both under long term and medium-term storage conditions. These genetic resources are reservoirs of useful genes that can contribute to the present and future crop improvement programs. To promote the utilization of these resources, ICRISAT genebank developed diverse subsets in groundnut, such as core (1704 accessions), and mini core (184 accessions). Extensive evaluation of these subsets resulted in the development of trait-specific subsets for rust and late leaf spot (76 accessions) and multiple trait-specific subset (56 accessions). Furthermore, SSR-based genotyping of the global groundnut composite collection led to the formation of reference set (300 accessions). ICRISAT genebank, so far has distributed over 1.72 million seed samples to users in 151 countries, including, 102,859 samples of groundnut. Germplasm and breeding material distributed from ICRISAT led to development and release of 250 varieties in 39 countries. Genome-wide association studies on the mini-core collection have led to the identification of several MTAs linked with key traits such as fresh seed dormancy, stem rot resistance and nutritional traits. These genomic resources provide ample opportunities for germplasm curators, breeders and molecular biologists to optimize genebank operations, allele mining, identify genetically diverse material with traits of importance and accelerate crop improvement to enhance production in the face of climate change.

Keywords: Genebank, Germplasm, Landraces, Groundnut, Core, Mini-core, Trait specific subsets