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## The worldwide population structure of over 3,400 eggplant accessions identified by SPET genotyping

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#### ORAL PRESENTATIONS

The worldwide population structure of over 3,400 eggplant accessions identified by SPET genotyping.

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G2P-SOL (<http://www.g2p-sol.eu>) is an EU-funded project, bringing together the main European and international genebanks hosting germplasm of the four major Solanaceous crops: potato, tomato, pepper and eggplant. Within the project, about 5,900 eggplant accessions, including wild relatives of the crop, were inventoried. To provide genomic information on around 3,500 representative accessions, a custom set of 5K SPET probes (single primer enrichment technology, TECAN) was designed targeting SNPs evenly distributed all over the genome but mainly in gene-rich regions. After library preparation, Illumina sequencing and quality filtering, reads were aligned to the eggplant reference genome (version 4.1) using BWA-MEM and SNP calling was performed using GATK4.1.9. By removing accessions with low coverage sequencing data, 3,412 were retained and 120K polymorphic sites identified by applying stringent filtering criteria. Among them, 4,306 were SNPs targeted by the 5K probe set, while the remaining were accessory off-target SNPs. The identified SNPs provided information for identifying putative mislabeled accessions (i.e., wrong species assignment), and duplicates within and between genebanks. Moreover, they are exploitable for setting up screening protocols to avoid the acquisition of duplications by ex-situ maintainers. The population structure and genetic relationships of the eggplant accessions were investigated to build up a core collection for GWAS. Furthermore, based on historical phenotypic data available in genebanks, loci associated with key agronomic traits were identified. Our results demonstrate that SPET technology represents a valid alternative to random complexity reduction methods and arrays, proving a suitable tool for the highthroughput genotyping, management, and enhancement of genebank collections.

Key words: *Solanum melongena*, diversity, SPET

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