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### ► To cite this version:

Yuri Tikunov, Louis McLeod, Giorgio Tumino, Y Wu, Jérémy Salinier, et al.. Towards understanding of metabolic diversity of pepper fruit. XVII SOLANACEAE2022 International Conference on the Plant Family of Solanaceae, Nov 2022, THESSALONIKI, Greece. hal-04133409

**HAL Id: hal-04133409**

**<https://hal.inrae.fr/hal-04133409>**

Submitted on 19 Jun 2023

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XVII SOLANACEAE2022 International Conference on the Plant Family of Solanaceae November 1-5, 2022, THESSALONIKI, GREECE

#### ORAL PRESENTATIONS

Towards understanding of metabolic diversity of pepper fruit

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Among the Solanacea crops pepper – *Capsicum* spp – is the only one that can make one either smile or cry owing to presence of specific metabolites which pepper fruits accumulate. Diverse and recognizable flavor of bell pepper or chilli pepper is determined by specific volatile compounds, pungency, caused by capsaicinoids, is essential in some 44 World's cuisines, fruit color is determined by carotenoids and flavonoids, nutritional quality – by vitamins and antioxidants. World's gene banks possess a great genetic and phenotypic diversity of pepper that could be used to diversify the cultivated pepper germplasm. To study how the genetic diversity of the most cultivated pepper species *C. annuum* translates into metabolic diversity ripe fruits of a core collection of 450 accessions developed in the EU Horizon 2020 G2P-SOL project (<http://www.g2psol.eu/>) were profiled using different metabolomics platforms for volatile aroma compounds using GC-MS and for non-volatile secondary metabolites using LC-MS. Wide qualitative and quantitative metabolic variation was observed. Volatile esters, alkanes, terpenes and oxylipin volatiles determined the variation in the composition of aroma compounds. Flavonoids and capsaicinoids had the major contribution to the variation in semi-polar secondary metabolite composition. Compounds from the abovementioned

groups revealed highly similar quantitative patterns across the core collection suggesting a coordinate regulation of compounds that belong to the same biosynthetic origin. GWAS was performed using SNP data obtained using genotyping-by-sequencing and revealed multiple associations of the metabolic variation with genomic loci harboring known and novel candidate genes.

Key words: Capsicum, metabolomics, GWAS, fruit quality

Acknowledgment: This study was carried out as a part of G2P-SOL project, funded by the European Union Horizon 2020 research and innovation program under Grant Agreement No. 677379. We are also grateful to all the partners involved in G2P-SOL project.