

Genetic Resources (GR)

Exploring Spanish Watermelon Diversity for Resistance to Fungal Diseases

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Watermelon [*Citrullus lanatus* (Thumb.) Matsum. and Nakai] crops are affected by several soil-borne fungi as *Fusarium oxysporum* f. sp. *niveum* (*Fon*), *Monosporascus cannonballus* and *Macrophomina phaseolina* and more recently, by powdery mildew caused by *Podosphaera xanthii* which has become a concern among growers. In Spain, little research has been done until now searching for resistance sources, in spite of the occurrence and spread of these diseases and the existing and unexplored Spanish watermelon diversity. One hundred and twenty one Spanish watermelon accessions were artificially inoculated with the isolate RZ1 belonging to *P. xanthii* race 1W by using a conidia suspension ($4,2 \times 10^4$ cel/mL). No immune watermelon accession to powdery mildew was found and most of them were highly susceptible, with profuse sporulation of the fungus. However two accessions of *C. lanatus citroides* (NC079249 and NC0100745) and two of *C. lanatus lanatus* (NC054847 and NC082460) showed very low level of sporulation. Sixty-four of these accessions were also inoculated with an isolate of *Fon* race 2 by using a conidial suspension (3×10^6 cel/mL). Most of the accessions were susceptible and only four accessions of *C. lanatus lanatus*, NC042492, NC026156, NC054866 y NC047502 showed a high level of resistance. This subset was also evaluated against *M. cannonballus* and *M. phaseolina*, inoculating the roots with an aggressive isolate of each pathogen, grown in wheat seeds (200 gr of infected wheat seeds/kg of peat) and with the toothpick/stem method, respectively. *M. phaseolina* was less aggressive in our conditions, and six highly resistant accessions were found. Interestingly, one of them was NC079249, also resistant to powdery mildew, and a second *citroides* accession NC100274. Two of the accessions resistant to *Fon*, NC042492 and NC026156, were also moderately resistant to *M. phaseolina*. *M. cannonballus* was very aggressive and severe root and hypocotyl damage was found in most accessions; the *citroides* accession NC100274 was one of the few highly resistant to *M. cannonballus*. Results allowed the selection of accessions multi-resistant to the main fungi affecting watermelon that will be used in breeding programs. This work was partially funded by Spanish grants AGL2017-85563-C2-1-R and AGL2017-85563-C2-2-R.

Session Topic

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