

# Interspecific hybridization between *Asparagus officinalis* and *Asparagus prostratus* to transmit *Asparagus virus 1* resistance

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Interspecific hybridization is an excellent method to increase the genetic variability of *Asparagus officinalis* and to develop new cultivars with biotic and abiotic resistance.

*A. officinalis* is afflicted with a variety of diseases. The most common one is the *Asparagus virus 1* (AV-1), which is distributed worldwide but no virus-like symptoms have been observed on infected asparagus plants. Detrimental effects on vigor, yield and quality as well as increasing susceptibility to fungal diseases are often reported due to viral pathogens. AV-1 is transmitted in a non-persistent manner by the green peach aphid (*Myzus persicae*) and by mechanically transmission. The infection with AV-1 cannot be prevented by pesticides and up to now no AV-1 resistance is known in asparagus cultivars. Therefore breeding for resistance is the best solution for a sustainable asparagus production. The genetic diversity in *A. officinalis* is limited but the wild relative *A. prostratus* is resistant against the AV-1 virus. *A. prostratus* grows on dunes and other maritime habitats on the Atlantic coast. The plants are very different in appearance and character from cultivated forms.

We successfully developed an interspecific hybrid between *A. officinalis* ( $2n = 2x = 20$ ) and *A. prostratus* ( $2n = 4x = 40$ ) by manual crosses. We used embryo rescue to overcome the crossing border. The cytological investigation of the hybrid plants (F1) showed the expected number of 30 chromosomes. These plants were back crossed with diploid *A. officinalis* genotypes and plants of the first backcrossing generation (BC1) contain approximate 26 chromosomes. In the next crossing step the BC1 plants will be again back crossed with diploid *A. officinalis* genotypes.

The F1 and BC1 hybrid plants segregate for AV-1 resistance. To identify molecular markers linked to the AV-1 resistance we performed a bulked segregant analysis. In this we pooled DNA samples of 9 resistant hybrids plants and compared it with a bulk containing DNA of 13 susceptible hybrid plants. 75 SSR marker were tested and amplified 185 bands. 66.5 % of them were polymorphic in the parental generation but none of them was linked to AV-1. In the next step the bulks will be increased with DNA of new BC1 plants and the bulked segregant analysis will be performed using AFLP.