

A NEW ARCELIN VARIANT RESPONSIBLE FOR RESISTANCE OF COMMON BEAN SEEDS TO BEAN WEEVILS?

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In common bean (*Phaseolus vulgaris*) the most abundant seed proteins are the storage protein phaseolin and a family of closely related proteins (lectin related APA proteins, ie Arcelin, Phytohemagglutinin, α -Amylase inhibitor), which are considered to play a role in plant defence. It has been shown that seeds from a restricted number of *P. vulgaris* wild varieties (Arcelin 1 to 7 genotypes) differ in their APA protein composition and the presence of Arcelin has been associated with resistance against bean weevils (the Mexican bean weevil, *Zabrotes subfasciatus* and the bean weevil, *Acanthoscelides obtectus*). So far Arcelin has only been found in wild common bean seeds originating from Mexico. Besides many efforts, a successful breeding of the genetic trait linked to the weevils' resistance into cultivated genotypes has not yet been achieved. This can be explained by the complexity of the APA locus and the lack of knowledge of which and how many APA proteins are involved in the mechanism of resistance.

In the present work, 34 wild bean populations collected in Mexico were used to study the performance of the bean weevil, *Acanthoscelides obtectus* and the Mexican bean weevil, *Zabrotes subfasciatus* and the hymenopteran wasp, *Dinarmus basalis*, an ectoparasitoid of *A. obtectus*. Bean population significantly influenced bean weevil and parasitoid development. From some populations fewer, less heavy beetles and smaller parasitoids emerged and developmental time was significantly longer. Seeds of these populations were subjected to SDS-PAGE and Western blot analyses using APA protein specific antibodies. One of the two most resistant bean populations (QUES) showed a new APA pattern. Biochemical (2D-PAGE coupled to LC-MS/MS analyses) and molecular (cDNA sequence and microsatellite analyses) data confirmed that the QUES genotype contains a new Arcelin variant.