Evaluation of pepper breeding lines and accessions to Xanthomonas euvesicatoria and X. vesicatoria and fruit traits

K. Vasileva* & V. Todorova

Agricultural Academy, Maritsa Vegetable Crops Research Institute, 4003 Plovdiv, Bulgaria

* Corresponding author: kkvasileva@abv.bg

Bacterial spot of pepper caused by *Xanthomonas euvesicatoria* and *X. vesicatoria* is a serious disease of economic importance. Until now, no pepper cultivar resistant to these economically important pathogens has been developed in Bulgaria. In this sense, the first step in the breeding process is the search, identification, or creation of genetic sources of resistance from different pepper, with diverse fruit characteristics. The aim of the study was identification of the causative agents of bacterial spot and evaluation of the resistance of pepper breeding lines and accessions to their most common races and some fruit traits. At the beginning the bacterial species *X. euvesicatoria* and *X. vesicatoria* were isolated from pepper and molecularly identified. The isolates belonging to *X. euvesicatoria* refer to pathotypes P (P6 with 2 strains and P4 with 2 strains) and PT (P4T2 with 5 strains and P2T2 with 2 strains). The predominant races of *X. vesicatoria* were PT (P1T2 with 3 strains and P2 with 2 strains). From all examined isolates, it was established that *X. euvesicatoria* was more often isolated from pepper. Of the available pepper gene pool, 13 breeding lines and 3 accessions have been studied for their reaction to *X. euvesicatoria* P6, P4T2, and *X. vesicatoria* P2 and P1T2. The tested genotypes were characterized by a different degree of attack when artificially inoculated with P and PT pathotype of *X. euvesicatoria* and *X. vesicatoria*. Immune to *X. euvesicatoria* P6, P4T2, and *X. vesicatoria* P2, P1T2 were pepper genotypes K915, K917, K925, SOL-300 and SOL-361, the rest were classified as resistant. the studied genotypes varied by phenotypic characterization – size, shape, orientation, colour, and taste of the fruits and possess resistance or immunity to bacterial spot. Breeding line K915 has been identified as immune to all studied races of bacterial spot (*X. euvesicatoria* P6 and P4T2 and *X. vesicatoria* P2 and P1T2), which, combined with its fruit characteristics, makes it extremely valuable for breeding activity in this direction. The Balkan region and Bulgaria in particular, are well-known by the presence of a rich diverse of pepper cultivars (*Capsicum annuum*) with different taste, color and morphological characteristics of the fruit, which are sought by users for specific consumption directions. The immune and resistant breeding lines of pepper with various fruit characters established in this study are a valuable prerequisite for the successful creation of pepper cultivars resistant to bacterial spot with different ways of production and usage to meet the demands of farmers, processors, and consumers.

Keywords: Capsicum; pathotype; resistance; PCR amplification; fruit weight; length