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Selection for Resistance and Biocheical Bases of Moderate Resistance in Spring Wheat to Aphids

Total 1429 spring wheat varieties orginated from Triticum aestivum L; T. a. var. erythroleucon; var. plinianum and T. spelta var bartiaricum were screened for resistance to two aphid species Rhopalosiphum padi and Sitobion avenae. Seven varieties showing various level of susceptibility were selected for more advanced studies. Four following indeces were used to describe the effect of wheat variety on aphid biology: (1) number of aphids for plant counted at least four times during growing season under natural field infestation; (2) number of aphids/plant under artificial infestation by the same initial population; (3) number of larvae/caged female/day measured during 10 consecutive days; and (4) number of embryos in females of known age reared on various cultivars under field and insectory conditions. Chiddam (T. aestivum) and 3025 (T.a var.erythrospermum) were used as moderate resistant and Ruska Pozehnana (T.t.var.plinianum) ; Cascalvo (T.t.var.gentile) and Maris Ensign (T.a.var.lutescens) were selected as susceptible. The average number of aphids per stem was equal 685.1 for Ruska Pozehnana, 602.4 for Maris Ensign, 547.9 - T. spelta var bartiaricum; 527.2-Cascalvo; 376.4 - Chiddam; 325.2 - Chifen and 146.8-3025. The average fecundity of R.padi on Cascalvo was 4.61/female/day; 4.3-Ruska Pozehnana; 3.7-Chifen; 3.8-Maris Ensign and var. bartiaricum; 3.1-Chiddam and 2.8-3025. The fecundity of S. avenae on Chifen was 5.3; Ruska Pozehnana - 5.0; 4.8 - v.bartiaricum; 3.9-3025; 35-Cascalvo - 3.6-maris Ensign and 2.9-Chiddam. Lower number of stomata on bottom side of leaves and higher density of hairs on upper and bottom side of leaves was found on moderate resistant cultivars. Lower concentration of free and protein-bound amino acids was correlated with lower fecundity of S. avenae (especially with serine and histidine) and proline with R. padi. Also lower ratio of protein-bound amino acids to total sugars was correlated with resistance level.