

# Symposium on Genetics and Plant Breeding in Cereals: 100th Birth Anniversary of Academician Slavko Borojević (1919-2019)



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Novi Sad, Serbia, 13-15th November 2019, organized by the Serbian Academy of Sciences and Arts – Branch in Novi Sad, Faculty of Agriculture of the University of Novi Sad, and Institute of Field and Vegetable Crops in Novi Sad



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Academician Slavko Borojević (1919-2019)

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## **Characterisation of Small Grains Resources at IFVCNS with UPOV Descriptors**

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Characterisation of genetic diversity of small grains germplasm is important for their identification, classification and efficient use in breeding. The aim of this study was to assess genetic diversity of winter wheat, durum wheat and triticale varieties and breeder's lines developed at the Institute of Field and Vegetable Crops, Serbia, during the last 50 years, with morphological characteristics. A total of 26 morphological traits were used for characterization as described in the guidelines for the conduct of tests for Distinctness, Uniformity and Stability of the International Union for Protection of New Varieties of Plants. The normalised Shannon diversity index ( $H'$ ) was used as a measure of morphological diversity. The homogeneity analysis was used to analyse the patterns of variations with categorical data with the R package Homals. An R package VarSelLCM was used to determine the most relevant characteristics for clustering the genotypes. On average, the diversity was higher for traits relating to generative than for those associated with vegetative organs in bread and durum wheat, while in triticale the diversity was higher for traits relating to vegetative plant organs. The Shannon diversity index in bread wheat genotypes ranged from 0.63, to 1.49, with the mean of 1.10, indicating a high morphological diversity. The lower level of morphological diversity was observed in durum wheat, with the smallest mean value of  $H'$  of 0.616 and a range from 0.28 to 0.950. The triticale genotypes showed medium level of morphological diversity with  $H'$  varying from 0.235, to 1.457, and the mean value of 0.752. The traits of bread wheat that contributed the most to the distinction of varieties were the presence of scurs or awns on ears, shoulder width of lower glumes, beak length of lower glumes and seasonal type. In durum wheat, traits that contributed the most to the distinction of genotypes were the ear colouration, length of beak of the lower glume, lower glume shape, ear length of awns at tip relative to ear length and colour of awns. In triticale, growth habit, density of hairiness of neck on stem, time of ear emergence and ear density had the largest contribution to differentiation of the genotypes. Morphological characterization using the traits with the highest discriminative power could be a useful complementary method for comprehensive wheat germplasm classification and diversity analysis.

**Key words:** small grains, diversity, morphological traits

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