by ^{60}Co-γ ray before flowering. Anthers were removed from the irradiated florets on the same day and the florets were pollinated with normal fresh pollens of *T. aestivum* cv. Chinese Spring. Genomic *in situ* hybridization (GISH) on preparations of root-tip cells at mitosis metaphase was used to detect chromosome structural changes with small segments of 6VS. More than 20 new translocations and deletions involved in different regions of chromosome 6VS have been obtained. Several intercalary translocations with powdery mildew resistance gene *Pm21* have been developed. Irradiating mature female gametes of whole arm translocation is a new and highly efficient approach for creation of small segment chromosome structural changes, especially for interstitial translocations.

Cloning and transfer of powdery mildew resistance gene.

A microarray analysis using the barley Affymetrix Gene-Chip was conducted to clone candidate genes of *Pm21*. A full length candidate clone has been identified. The candidate gene was transformed into a wheat variety Yangmai 158, which is susceptible to powdery mildew, using a shot-gun method. The transgenic plants showed high powdery mildew resistance, indicating its good compensation function.

ITEMS FROM CROATIA

BC INSTITUTE FOR BREEDING AND PRODUCTION OF FIELD CROPS
Rugvica, Dugoselska 7, 10370 Dugo Selo, Croatia.

Preliminary testing of the new Bc winter wheat lines for resistance to Fusarium head blight (Fusarium graminearum Schw.).

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Diseases caused by fungi of the genus *Fusarium* spp. inflict heavy damages in many wheat-growing regions world wide. Fungi of the genus *Fusarium* produce micotoxins (DON and ZEN) that have harmful effect on health of humans and domestic animals. The spread of this disease is the result of intensive growth of semidwarf wheat cultivars in the narrow maize–wheat rotation. Among the measures of control of this disease, breeding for resistance is one of the most important. Development of reliable techniques for artificial inoculation is a prerequisite for wheat breeding for disease resistance to be able to test a large number of materials in the breeding process. Every year about 1,000 wheat genotypes are tested under conditions of artificial inoculation with *F. graminearum* at the Bc Institute. The hightest yielding and most resistant lines with other good agronomic traits were screened in preliminary trials to be tested in exact trial (Fig. 1). In a trial with four replications in Botinec in 2008, the 25 highest yielding winter wheat lines were planted with artificial inoculation with *F. graminearum* (Fig. 2, p. 52). These investigations compared resistance to Fusarium head blight of the wheat lines from the exact trial with the resistance scores of the lines from preliminary trials in 2007. Significant differences in levels of resistance among the tested wheat lines were obtained in the 2008 trial. Visual rating of infection (VRI) ranged from 0.58 to 47.81. The most resistant lines were Bc 14 (3.71), Bc 12 (3.85), and Bc 1 (8.25), followed by

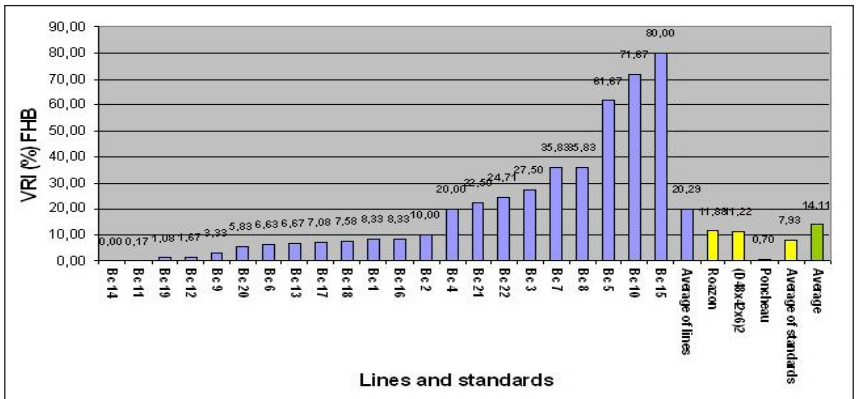

Fig. 1. Resistance to Fusarium head blight in 22 new Bc winter wheat lines in comparison with standards. Results are from preliminary trials screened after artificial infection, Botinec 2007.

Table 1. Bc winter wheat lines from exact cultivar trials with a high level of resistance to Fusarium head blight after artificial infection in comparison with standard cultivars, Botinec 2008.

Line	Fuarium head blight – visual rating of infection (%)
Bc 14	3.71 **
Bc 12	3.85 **
Bc 1	8.25 *
Bc 18	13.77 *
Bc 17	14.27 *
Bc 9	14.44 *
Average	9.71
Standards	
Roazon	14.89 *
(D48x42x6)2	6.75 **
Poncheau	0.58 **
Average of standards	7.41
Average	8.56

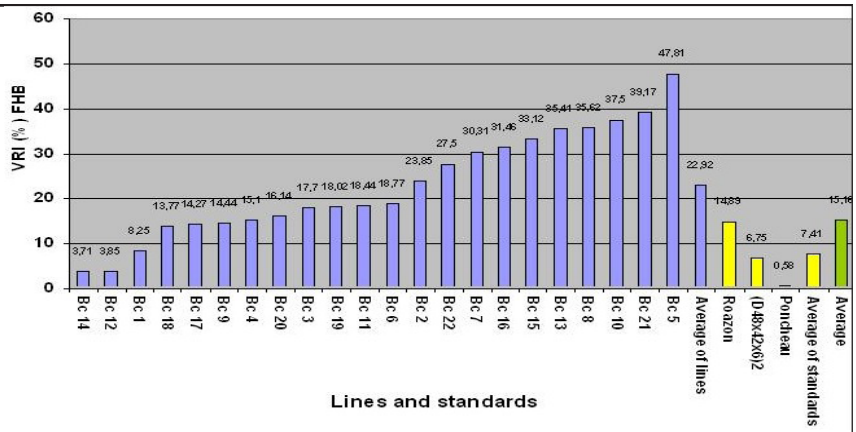

Fig. 2. Resistance to Fusarium head blight of 22 new Bc winter wheat lines in comparison with standards in exact cultivar trials after artificial infection, Botinec 2008.

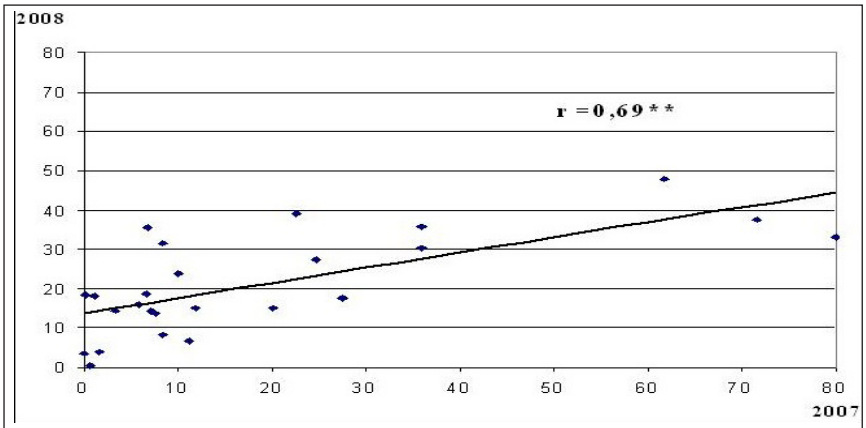

Fig. 3. Correlation between 22 Bc winter wheat lines and three standards for resistance to Fusarium head blight. Tested in preliminary investigations and in exact cultivar trials after artificial infection, Botinec 2007 and 2008.

Bc 18 (13.77), Bc 17 (14.27), and Bc 9 (14.44) (Table 1). A strong correlation between wheat lines of resistance to Fusarium head blight in the exact trial and in preliminary investigations (r = 0.69) was obtained, which proves the reliability of the preliminary results (Fig. 3). The artificial inoculation technique and evaluation of Fusarium head blight using VRI was suitable for testing a large number of wheat lines.

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