Our organic breeding program is highly focused on the development of new, organic cultivars of alternative or underutilized cereals such as einkorn and emmer. A new, organically bred, einkorn cultivar, **Mv Menket**, was released last year. This is the first semidwarf einkorn cultivar in the market, with elevated yield potential, and excellent resistance against most of the wheat diseases, except Fusarium. Mv Menket is an organic cultivar, because it is highly sensitive against all herbicides used in the Hungarian farming practice, and there is no possibility to use it in traditional agricultural practices.

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ITEMS FROM INDIA

DIRECTORATE OF WHEAT RESEARCH
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A study of floral biology traits in bread wheat.

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Summary. Three floral biology traits, anther length, stigma length, and anther extrusion, were investigated in 92 elite wheat germ plasm lines. A wide range of variability was observed for these floral traits and promising genotypes were identified for their further utilization as parents for hybrid wheat development.

Wheat productivity levels in the present genotypes have reached a saturation level, which limits higher production to meet the targets for food security. Newer, innovative techniques can be promising approaches in order to break yield barriers and, in this regard, hybrid wheat development through exploitation of heterosis may be a potential tool. Wheat production in the Northwest Plains Zone has reached peak yields. Knowledge about the variability and character association between floral characteristics is crucial to identify suitable male or female parental lines for further utilization in hybrid development programs. Our objective was to study the extent of variability present in some wheat genotypes for various floral characters and establish correlations between them.

Materials and methods. A total of 92 elite genotypes maintained by the Hybrid Wheat Programme were used in the study. These entries included elite selections from international nurseries and trials from CIMMYT; genetic stocks;

advanced lines for yield, abiotic stress tolerance, and disease resistance; and yield component lines. The experiment was laid out in randomized block design with three replications with plot size of double row of 2.5-m in length. All agronomical practices for raising a good crop were adopted. Wheat is a self pollinated crop and, therefore, floral traits promoting out crossing were investigated. The genotypes were evaluated for three floral traits, anther length, stigma length, and anther extrusion in order to get basic information about their floral behavior. Observations were taken on 10 randomly selected plants from each replication. Anther length was measured in mm and recorded as the average length of three anthers belonging to the lateral florets of the two central spikelets of a spike. Stigma length also was measured in mm and recorded as the average length of two stigmas of the lateral florets from two central spikelets of a spike. Anther extrusion was measured as a percent after counting the extruded anthers of two lateral florets of five central spikelets from 10 spikes/replication. The data were analyzed (Panse and Sukhatme 1967) to work out the range, mean, and correlations among the traits and to identify promising genotypes for further utilization.

Results and discussion. Mean values for various traits in different genotypes indicated a very wide range for all three traits under study (Table 1). Anther length ranged from 3.20 to 5.60 mm with a mean value of 4.53 mm. Stigma length ranged from 2.20 to 4.30 mm with a mean value of 3.10 mm. Anther extrusion ranged from 15.17% to 63.07% with an average value of 33.27%. Similar findings also were reported by Hucl (1996), Singh and Joshi (2003), and Singh (2006). The association between these floral traits indicated a high correlation between anther and stigma length.

Table 1. Range, mean, and character association for floral traits in wheat.

Floral trait	Range	Mean	Correlation coefficient	
			Stigma length	Anther extrusion
Anther length (mm)	3.20–5.60	4.53	0.36	0.08
Stigma length (mm)	2.20–4.30	3.10		–0.03
Anther extrusion (%)	15.17–63.07	33.27		

The frequency of genotypes in the different floral traits classes also was recorded (Fig. 1). Most of the genotypes showed an anther length of 4.51–5.00 mm, a stigma length of 2.51–3.00 mm, and anther extrusion of 25.1–45.0%.Twelve genotypes had an anther length of more than 5.0 mm. Genotype HT 97 had longest anthers, at 5.60 mm, followed by Giant 3 and KRL 237 (5.50 mm). Other genotypes with promising anther lengths were 25 SAWSN 3034, 25 SAWSN 3178, DWR 39, GW 273, HD 2009, HUW 34/LR 19, KRL236, LOK 62, and NIAW 1275. HI 1077 showed the highest anther extrusion of 63.07%, followed by 18 HRWSN 2066 (55.91%) and 15 HRWYT 222 (55.63%). NIAW 1275 was the only genotype with a stigma length (4.30 mm) of more than 4.0 mm.

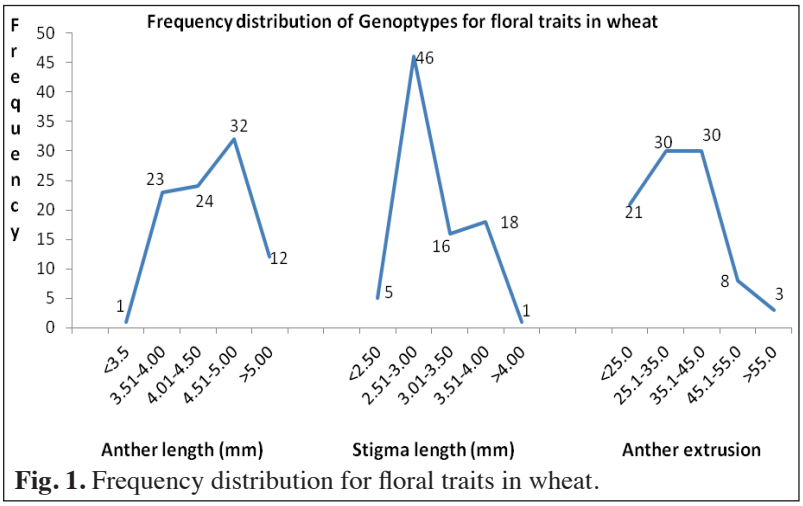

Fig. 1. Frequency distribution for floral traits in wheat.

Based on the performance for various floral traits, promising genotypes with high values were identified (Table 2, p. 81). Among these, 15 HRWYT 222, 25 SAWSN 3034, GW 273, HD 2329, KRL 236, and NIAW 1275 were found promising for two or more floral traits. These can be further utilized in conversion into CMS and restorer lines for hybrid wheat development.

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Table 2. Promising genotypes for floral traits.

Genotype	Anther length (mm: >5.00)	Stigma length (mm: >3.75)	Anther extrusion (%: >40.0)
15 HRWYT 222	5.00	3.90	55.63
18 HRWSN 2066	4.00	2.60	55.91
25 SAWSN 3034	5.20	3.50	47.36
25 SAWSN 3169	5.00	4.00	24.79
25 SAWSN 3178	5.20	2.70	37.75
DWR 39	5.10	3.10	25.34
FLW 8	5.00	4.00	23.59
GIANT 3	5.50	3.50	27.43
GW 273	5.20	2.50	45.13
GW 411	5.00	4.00	20.15
HD 2009	5.30	2.50	38.08
HD 2329	5.00	4.00	40.03
HI 1077	5.00	2.90	63.07
HP 1296	5.00	3.90	36.11
HT97	5.60	3.70	51.23
HUW 34/LR 19	5.20	2.50	22.13
KRL 237	5.50	3.00	23.33
KRL236	5.30	3.80	29.89
LOK 62	5.30	2.60	21.46
NIAW 1275	5.20	4.30	36.84
PHR 1005	4.50	3.00	53.55
UAS 323	5.00	3.90	22.05

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Molecular and phenotypic diagnostics applied to verify the presence of rust resistance genes Lr24, Yr15, and Sr2 in a high-yielding bread wheat genotype suited for cultivation in Central India.

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Wheat area, production, and productivity in the Central Zone (CZ) of India is steadily increasing and this increase in area is attributed to a slow shift from rainfed to limited irrigated areas with the advent of modern irrigation facilities adopted by farmers. This shift leads to an increase in the demand for cultivars suitable for irrigated, timely sown conditions. A bread wheat genotype developed at the IARI, Regional Station, Wellington, and designated as HW 5207, has the potential to meet this requirement, because it has shown consistent yield under conditions prevailing in the CZ. The proposed cultivar carries the durable stem rust resistance gene *Sr2* and leaf rust resistance gene *Lr24* (resistant to all Indian pathotypes of leaf rust) providing high degree of resistance to stem and leaf rusts and *Yr15* for yellow rust resistance. Thus, the identification of HW 5207 as a suitable genotype for cultivation in the CZ will provide an alternative as well as add to the desired genetic variability in terms of yield and rust resistance in the CZ.

Materials and methods. The wheat genotype HW 5207 (HW stands for Hybrid Wellington) was developed by the pedigree method from the cross 'HW 3029//*Yr15* (V763-2312)' and tested under multilocation yield trials in the CZ conducted under the aegis of All India Coordinated Wheat and Barley Improvement Project (AICW&BIP) coordinated by the Directorate of Wheat Research (DWR), Karnal (Haryana) for irrigated, timely sown conditions. Trials were conducted