

RESEARCH ON MAIN MORPHOLOGICAL AND PHYSIOLOGICAL CHARACTERS OF THE SPECIES *BRASSICA OLERACEA* VAR. *ACEPHALA* IN IAȘI

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Abstract

The research was based on morphological and physiological characterization of a range of eight hybrids of ornamental cabbage, as forms of cabbage leaves (*Brassica oleracea* var. *Acephala* DC). The research was conducted in 2011 in the experimental field of the Department of Vegetable, within USAMV to farm "Vasile Adamache". The aim of the research was to promote forms of ornamental cabbage studied to enrich knowledge of these varieties and their exploitation in landscape architecture. The results obtained showed the influence of hybrids and B factor (month) on plant height, influence of hybrids and B factor (month) to the number of leaves and vegetative mass dynamics of the species studied. Analysis of hybrids and B factor (month) on plant height and number of leaves showed a progressive increase in the values recorded by them. Number of leaves ranged from 10.48 to 26.33 Crane Pink hybrid to Red Peacock hybrid. Regarding the vegetative mass is noted that the Glamour Red hybrid achieves highest vegetative mass of 800.6 g and hybrid lowest mass Crane Pink vegetative, respectively 591.6.

Key words: *Brassica oleracea* var. *acephala*, physiology, morphology, biological development.

The value of ornamental kale (*Brassica oleracea* var. *Acephala*) is given mainly by the shape, appearance and color of leaves in the rosette and partially stripped.

Ornamental cabbage can assert in landscape architecture in rabats, flats, mosaics, arabesques, borders and pots but in various forms: oval leaf lirate, corrugated or obovate, spherical, round leaf, lirate or embossed and round-flattened with leaf corrugated.

Regarding the importance of food, cabbage leaf is grown for its leaves that are made simple green salad or assorted salads cooked - used as a garnish, soups, sautéing or smoothies. Food value is given by high dry matter content, higher green cabbages, like Brussels sprouts. Green leaf culinary gives an attractive appearance. The origin of this variety is found in several branches threaded wild cabbage (*Brassica oleracea* var. *silvestris*). (Stan și Munteanu, 2001).

Wild cabbage cultivation was done very early in the history of human civilization and the

plant is often considered one of the oldest of all vegetable species used historical evidence suggesting that people began cultivating green leaves four millennia ago in the Middle East. The ancient Greeks were familiar with cabbage; in fact, it is considered that they used it to induce lactation in pregnant women.

In the following centuries, the Romans produced a cabbage based in treatment to eliminate the toxic effects of alcohol, since cabbage can prevent and reduce the impact of alcohol use disorder followed in large quantities. (Beceanu, 1991).

Cabbage is also important because of its therapeutic properties, which reported in literature since ancient times, being advised to treat wounds, stomach ulcers, with favorable effect on digestion.

This study aims to highlight some elements on the morphology and physiology of a variety of ornamental cabbage in its effective use in landscaping.

MATERIAL AND METHOD

The research was conducted in 2011 in the experimental field of the Department of Vegetable, within USAMV to farm "Vasile Adamache".

The material used in this experiment consisted of biological material of eight ornamental cabbage hybrids, and other so called technical and biotechnical materials.

The biological material consisted of seeds and seedlings, seeds purchased from Nicky's Nursery Ltd., England.

For morphological and physiological characterization were used ornamental cabbage seedlings of eight hybrids included in the study: Red Peacock White Peacock Queen Coral, Coral Prince, bicolor Crane, Crane Pink, Red Crane, and Glamour Red.

The culture was established by seedlings produced in greenhouses in cellular trays.

Seedling was produced in a peat substrate, manure and earth. At planting, the seedlings were aged 45-50 days. Sowing was done on 15 March and planting seedlings in the field was carried out on 10 May in all eight hybrids, place-plots, in three repetitions.

The distance between plants in the row was 75-80 cm and 50 cm between plants at a time.

Morphological and physiological characterization was carried out as an average of six months of observation, based on the following measurements: plant height, number of leaves and vegetative mass.

Plant harvesting fresh vegetative mass was effectuated at the beginning of November.

The experimental data were processed by statistical methods and summarizes the tables.

RESULTS AND DISCUSSIONS

In 2011, ornamental cabbage hybrids have significantly influenced plant height and number of leaves.

Table 1

Hybrids influence on plant height

Name of factor	Plant Height (cm)	% compared to the witness	Differences (cm)	Meaning
Glamour Red F ₁	39.17	100.00	Witness	-
Red Peacock F ₁	40.66	103.80	1.49	***
White Peacock F ₁	43.34	110.65	4.17	***
Crane Red F ₁	49.13	125.41	9.96	***
Crane Pink F ₁	50.14	127.99	10.97	***
Crane Bicolor F ₁	49.51	126.40	10.34	***
Coral Queen F ₁	46.47	118.65	7.30	***
Coral Prince F ₁	29.27	74.73	-9.90	000

LD 5% : 0.3 *LD= limited differences

LD 1% : 0.4

LD 0.1% : 0.5

Ornamental cabbage hybrids included in the study were positively influenced plant height.

Of the eight hybrids, six achieved very significant differences from the control and Coral

Prince made a hybrid plant height less than 9.9 cm, the difference is very significantly negative (tab.1).

Table 2

B factor influence (month) on plant height

Name of factor	Plant Height	% compared to the witness	Differences	Meaning
June	16.01	36.61	-27.73	000
July	23.51	53.76	-20.23	000
August	34.13	78.02	-9.62	000
September	43.74	100.00	Witness	-
October	65.49	149.72	21.75	***
November	89.53	204.68	45.79	***

LD 5% : 0.3 *LD= limited differences

LD 1% : 0.4

LD 0.1% : 0.5

Ornamental cabbage forms have its all vegetative organs in September. Species of ornamental cabbage height increased from 16.01

cm in June to 89.53 cm in November, when it reached physiological maturity.

In June, July and August, plants have achieved very significant differences compared to control negative, between -9.62 cm and -27.73

cm, and October and November have made gains of 49.72% and 104.68% differences are highly significant (tab.2).

Table 3

Hybrids influence on the number of leaves

Name of factor	Number of leaves	% compared to the witness	Differences	Meaning
Glamour Red F₁	22.30	100.00	0.00	-
Red Peacock F₁	26.33	118.09	4.03	***
White Peacock F₁	20.12	90.21	-2.18	000
Crane Red F₁	10.98	49.25	-11.32	000
Crane Pink F₁	10.48	47.01	-11.82	000
Crane Bicolor F₁	11.88	53.29	-10.42	000
Coral Queen F₁	16.90	75.78	-5.40	000
Coral Prince F₁	17.75	79.60	-4.55	000

LD 5% : 0.3 LD 1% : 0.4 LD 0.1% : 0.6 *LD= limited differences

Red Peacock hybrid achieved a maximum number of leaves 26.33, with 4.03 more than the control group (Glamour Red x 22.30), the

difference being very significant. Other varieties have made very significant differences from the control minus (tab.3).

Table 4

B factor influence (month) on the number of leaves

Name of factor	Number of leaves	% compared to the witness	Differences	Meaning
June	8.01	48.30	-8.58	ooo
July	10.78	64.95	-5.82	ooo
August	13.69	82.50	-2.90	ooo
September	16.59	100.00	0.00	-
October	22.50	135.62	5.91	***
November	31.00	186.86	14.41	***

LD5% : 0.2 LD1% : 0.3 DL0.1% : 0.4 *LD= limited differences

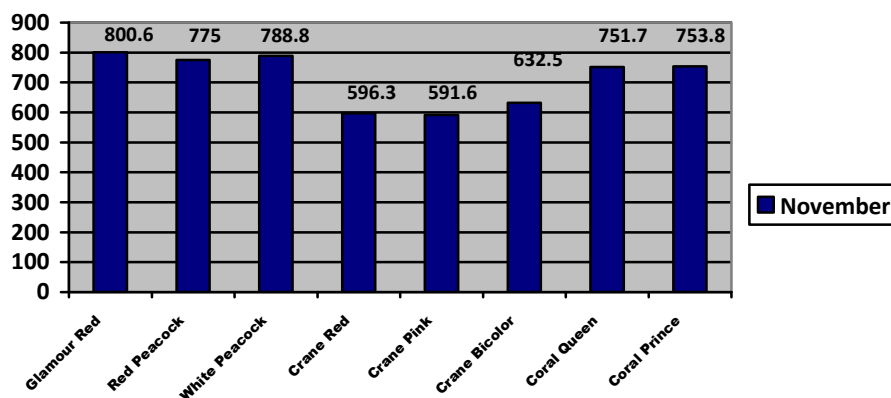


Figure 1 Results on the dynamics of vegetative mass of ornamental kale

Number of leaves ranged from 8.01 in June to 31.00 in November. In October and November the number of leaves was higher compared to the control with 5.91, respectively 14.41, which is very significant (tab.4).

Glamour hybrid achieves highest vegetative mass of 800.6 g. Climatic conditions in 2011 and the hybrids, vegetative mass ranged from 591.6 g to 800.6 g Crane Pink to the Glamour Red (fig.1).

CONCLUSIONS

From the comparative analysis of the eight ornamental cabbage hybrids, it appears that Red

1. Analysis of hybrids and B factor (month) on plant height and number of leaves showed a

progressive increase in the values recorded by them.

2. Following the results we can say that ornamental cabbage hybrids included in the study were positively influenced plant height. Number of leaves ranged from 10.48 to 26.33 Crane Pink hybrid to Red Peacock hybrid.

3. Regarding the vegetative mass is noted that the Glamour Red hybrid achieves highest vegetative mass of 800.6 g and hybrid lowest mass Crane Pink vegetative, respectively 591.6.

***<http://www.taifasuri.ro/taifasuri/farmacie-verde/612-varza-vindec-aproape-orice-fel-de-ran.html>

REFERENCES

- Carmen-Maria Stoleru, Stan, N., Stan, C., 2008** – *Caracterizare morfologică, fizică și chimică a solului din solari, după cinci ani de fertilizare organică la Spătărești (județul Suceava)*, *Lucrări Științifice*, vol.51, seria Agronomie, p.661-666;
- Beceanu D., 1991** – *Varza pentru frunze – Origine, promovare în cultură și istoricul cultivării*, *Lucrări Științifice*, vol.33, seria Horticultură, p.16-20;
- Hiroshi, Y., Mohamed, M.H., Katsuei, T., 1994** – *Morphology, fertility and cross-compatibility of somatic hybrids between Brassica oleracea L. and B. campestris L.*, *Scientia Horticulturae*, Vol. 58, Issue 4, p283 - 288
- Stan N., Munteanu N., 2001** – *Legumicultură specială*, vol.II. Editura "Ion Ionescu de la Brad" Iași;