THE INFLUENCE OF SIMAZIN ON THE MITOTIC CHROMOSOMES OF *VICIA SATIVA* L

ODETTA GRAMA, CSILLA IULIANA BĂRA, ION I: BĂRA

Key words:*Vicia sativa* L., simazin, chromosomes, metaphase, karyotype.

Abstract: The first, the second, the fourth and the sixth pairs of chromosomes have the centromere in a submedian position. The third pair has the centromer in a subterminal position, the chromosomes being subtelocentriq.There is a secondary constriction that delimits the satellites at the level of the fifth pair of chromosomes.The simazin does not have implications on the chromosomes number.

INTRODUCTION

Vicia sativa L. is aperenial plant, known as having a spontaneous growth or being a cultivated plant, used as fodder or or fertilizer in the temperate and Mediteranean zones of the globe. Having as purpose to establish the chromosomes number at some species, to describe their structure and to arrange them in the karyotype, the cytogenetic studies are very important to the introduction and control in the improvement of some plants of economic interest, on a scientific basis. In almost all the studies (Tiță, 1992, 1996; Raicu, 1962; Popa, 2000), the number of chromosomes noticed at this species is 2n=12.

But Tiță(1996) mentioned the authors (Mettin and Hanelt, 1964) who noticed the number 2n=14. These observations referred probably to another taxonomic unit measure.

THE AIM OF INVESTIGATION

We have proposed to determine the simazin's action on the mitotic chromosomes and to establish the karyotype.

MATERIAL AND METHODS

Our analyses have been realized on individuals of the species of *Vicia sativa* L., cultivar *Vilena*, from ICCC of Moldavia Republic.

The description of chromosomes, from a morphometrical and typological point of view has been done according to the classical method of structuring the karyotype (Popa, 2000; Cîmpeanu, Maniu, Surugiu, 2001).

RESULTS AND DISCUSSIONS

The chromosomes number that we established both at the metaphase obtained by the treatment with colchicines, and also at the one resulted from the 12 hours treatment with 0.5% simazin, was 2n=12 (see figure 1 and 2). You could notice from the biometric study of chromosomes (table 1, figure 1) that the chromosomes total length was between 4.166 цm (the first pair) and 2 цm (the last pair). The relative length varied between 102.459 and 49.967 and the arms ratio had values between 4.25 and 1.66.

The arms ratio, a parameter which, together with the chromosomes total length, centromere index and difference between the arms, was used to establish the morphological type and which recorded values of 2.0 (first pair), 2.28 (second pair), 2.0 (fourth pair) and 2.66 (sixth pair).

The third pair of chromosomes had a subterminal position of the centromer, the chromosomes being telocentric, and they had evident unequal arms, their ratio being of 4.25. The fifth pair of chromosomes had satellites with a total length of 0.666 цm and the

arms ratio is of 1.66, belonging to the category of chromosomes with the centromer placed in a median position, thus, also being some of the chromosomes of median type.

We noticed, from figure 2 and table 2 (the metaphase resulted from variant treated 12 hours with 0.5% simazin) that the herbicide had no implications in the number of chromosomes, 2n being 12.

One demonstrated from the biometric analyses that the total length fo the chromosomed varied between 5.277 цm and 2.707 цm. The relative length varied between 98.308 and 50.444. The values of the centromerique index were between 48.299 and 27.142. The first, the second and the sixth pairs of chromosomes had the arms ratio between 1.98 and 2.61 and they were submetacentriq type, the third, the fourth and the fifth pairs had a median position of the centromer thus the chromosomes being medium ones. The fifth pair had satellites with a total length of 0.864 цm'

One could notice from this comparative study of the analysed karyotypes, the first by a process of treatment with colchicines, and the second at the treatment with simazin, that the first, the second and the sixth pairs were identical from a morphological point, the third and the fourth ones recorded some differences (the third pair and the fourth pair, after treatment with simazin).

CONCLUSIONS

The diploid number of chromosomes, at *Vicia sativa species* L., is 2n=12.

The first, the second, the fourth and the sixth pairs of chromosomes have the centromere in a submedian position.

The third pair has the centromer in a subterminal position, the chromosomes being subtelocentriq.

There is a secondary constriction that delimits the satellites at the level of the fifth pair of chromosomes.

The karyotype's asymmetry, at this species (**m, sm** and **st** chromosomes) has show that this species has an evolved karyotype.

The simazin does not have implications on the chromosomes number.

BIBLIOGRAPHY

Raicu P., 1962, *Metode noi in genetică*, Ed. Did. Şi Ped., Bucureşti, p.149.

1. **Tiță I., 1992,** *Studiul comparativ al ADN-ului nuclear şi evoluția din genul Vicia*, În: Cercetări de genetică vegetală şi animală, Institutul de cercetări pentru ceriale şi plante tehnice – Fundulea, p.71-75.
2. **Tiță I., 1996,** *Citogenetica şi evoluția plantelor*, Ed. Lotos, Craiova, p. 137-181.
3. **Popa N., 2000,** *Genetica*, Ed. USM, Chişinău, 38-44, 65-70.
4. **Cîmpeanu M., Maniu M., Surugiu C. I.., 2002,** *Genetica metode de studiu*, Ed. Corson, Iaşi, 141-142.
5. **Drăcea I., Butnaru G., Moisuc A., 1969,** *Influența cîtorva erbicide asupra cariotipului la porumb*, Cercetări de genetică, Lucrările Simpozionului II Național de Genetică (3-6 mai 1976), Ed. Did. Şi Ped., Bucureşti p. 366-372.

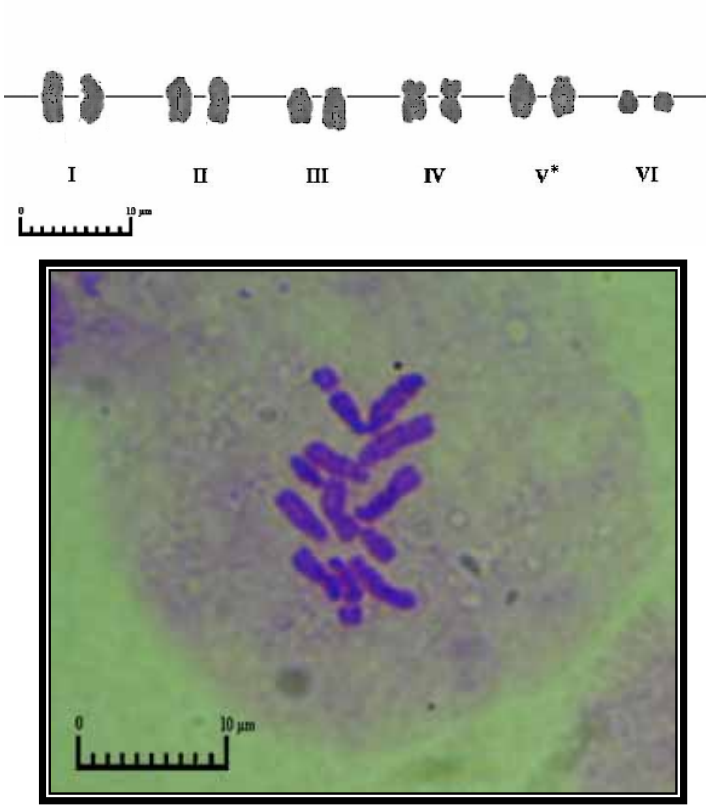
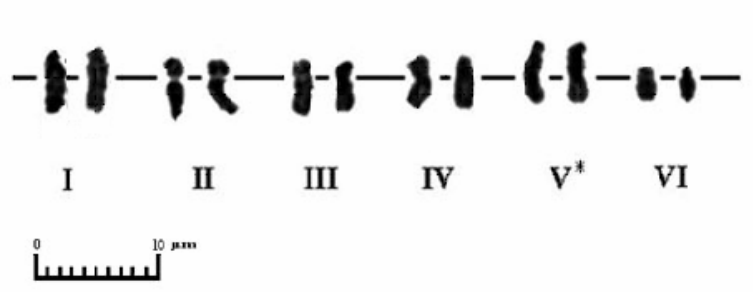
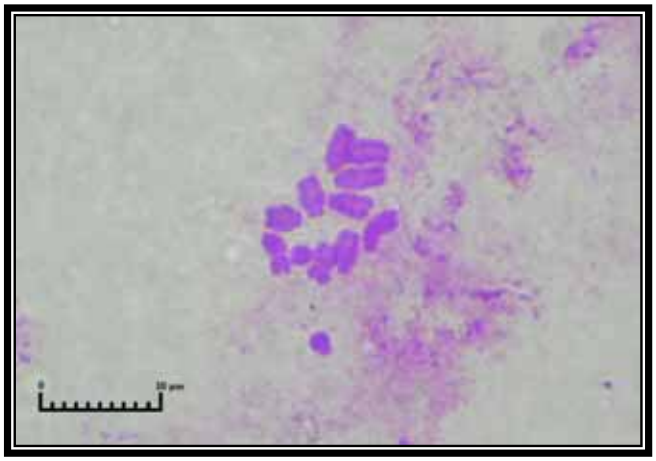


Fig. 1: Metafază şi cariotip la *Vicia sativa* L. (2n=12).





(*cromosom cu satelit)

Table: The chromosome features at *Vicia sativa* L. (2n=12) , treated with simazin.

The pair of chromosomes	The chromosomes type	The total length (µn)	The satellite length (µn)	The arms ratio	The centromeric index	The arms difference (µn)	The re relative length.
I	sm	5,277		2,61	32,944	7,65	98,308
II	sm	5,277		1,98	27,142	5,55	98,308
III	m	4,369		1,49	41,708	2,78	80,968
IV	m	4,307		1,17	48,229	1,75	80,252
V	m	4,923	0,846	1,19	35,937	1,1	91,716
VI	sm	2,707		2,38	30,403	3,7	50,444

Table 1: The chromosome features at de *Vicia sativa* L. (2n=12) species.

The pair of chromoso-mes	The chromoso-mes type	The total length (µn)	The satellite length (µn)	The arms ratio	The centromeric index	The arms difference (µn	The relative length
I	sm	4,166		2	32	1	102,459
II	sm	3,833		2,28	30,434	4,5	94,262
III	st	3,333		4,25	20	6,5	81,967
IV	sm	3,333		2	30	3	81,967
V	m	3,666	0,666	1,66	27,272	2	90,163
VI	sm	2,000		2,66	25	2,5	49,967