

CONTRIBUTIONS CONCERNING THE KARYOTYPE STUDY OF THE PLANT *VICIA SPARSIFLORA* Ten.

*ION TIȚĂ, MARIANA ACIU, MONICA TIȚĂ, MARIA BOGDAN

Key words: *Vicia sparsiflora* Ten., biometrical analysis, asymmetrical karyotype

Summary: In this paper the authors presents the karyotype of the plant *Vicia sparsiflora* Ten., from the County of Dolj flora. This species had a number of chromosomes $2n=12$. These 6 pairs of chromosomes are 3 subtelocentrics and 3 submetacentrics. The karyotype is assymetrical, for this reason the species is considered as evoluate in the genus *Vicia*, being unreasonable she's location in the Cracca section, the most primitive of these genus.

INTRODUCTION

From the systematic point of view, the species *Vicia sparsiflora* Ten. is a member of *Leguminosae* family, *Cracca* section [1].

The plant is generally widespread in Balkans and Italy. In Romania she is find only in the region of Oltenia, through stations with *Quercus cerris*: Obedin and Mihăița forests, Fărcașu, Polmelțu, Almăj, Valea Stanciului and Șaru forests.

In the speciality papers we find only a few old informations about the chromosomes numbers ($2n$) at this species: $2n=12$ (Baksay, 1956; Mettin, 1961), or $2n=14$ (Ledingham, 1957) [2, 4].

For the other part in Romania we don't find a study concerning the karyotype of these species, and this is the reason of our research.

MATERIAL AND METHOD

The biological material is represented by the small roots obtained directly from the plants which are recolted from the Șaru forest, County of Olt.

The chromosomal complement from radicular meristems cells was studied by Feulgen's method, using the squash type preparation. The microphotographs of metaphases were made by MBL 2100 microscope with a photoadapter. The chromosomes were cut out and measured with an engineer compass.

The karyotype for each species was made by arranging the homologue chromosomes in a decreasing order according to their total length. During the process of measuring the total chromosomes length the satellites length was not taken into account.

Biometrical analysis of the karyotypes comprised the following parameters: length of chromosomes branches (in μm), total chromosomes length (in μm), relative chromosomes length (in %), branches ratio (long/short), centromeric index, secondary constrictions, satellites length (in μ), and chromosome type. To define the centromer position and the different types of chromosomes, we have used the standardized nomenclature of Levan & al. (1966) [3].

Thus, chromosomes with a terminal centromer were designated as telocentrics (T), chromosomes with a centromer situated in the terminal region were designated as acrocentrics (A), chromosomes with a branches ratio between 1.0 and 1.7 were designated as metacentrics (M), chromosomes with a submedian centromer and a branches ratio between 1.7 and 3.0 were designated as submetacentrics (SM), and chromosomes with a centromer in the subterminal region and a branches ratio between 3.0 and 7.0 were designated subtelocentrics (ST).

* Pharmaceutical Botany, Faculty of Pharmacy, UMF Craiova, street Petru Rareș 4, 1100 Craiova

RESULTS AND DISCUSSIONS

In our research we find that the vegetal material studied presents the number of chromosomes $2n=12$. The same number of chromosomes was discovered by Baksay (1956).

From the statistical analysis of the plant karyotype (Tabel I) we have determined that the total length of the chromosomes is comprised between $4.17 \mu\text{m}$ and $6.47 \mu\text{m}$, and the relative length varies between 12.00 and 20.92%. The values of the centromeric index are comprised between 16.48 and 29.95.

The chromosomes pairs I, II, III have the branch ratio between 3.20 and 5.06; they are from subtelocentric type. The chromosomes pairs IV, V, and VI, have the branch ratio between 2.37 and 2.72, being from submetacentric type (Figure 1, Figure 2, Figure 3).



Figure 1 Metaphasis at *Vicia sparsiflora* Ten.

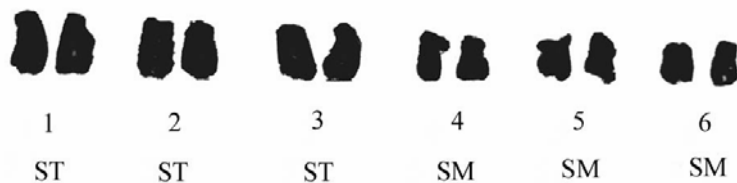


Figure 2 The karyotype of the species *Vicia sparsiflora* Ten.

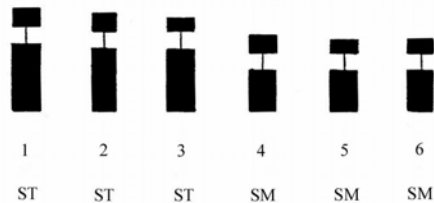


Figure 3 The idiogram of the species *Vicia sparsiflora* Ten.

Based on the Levitzky theory (1931) and Stebbins (1971), which consider that the symmetric karyotypes are primitives, and the asymmetric karyotypes are much specialized, the evolution going from the symmetric to the asymmetric karyotype, we can make the affirmation that the plant *Vicia sparsiflora* Ten. having an asymmetric karyotype, consequently she is highly developed.

The species is considered as evaluate in the genus *Vicia*, being unreasonable she's location in the *Cracca* section, the most primitive of these genus.

CONCLUSIONS

1. The plant *Vicia sparsiflora* Ten. from the Șaru forest, County of Olt had a number of chromosomes $2n = 12$.

2. The chromosomes pairs I, II, III are from subtelocentric type, and the pairs IV, V, VI from submetacentric type.

3. From the evolutive point of view and on the basis of the karyotype analysis, it has been found that the plant are highly developed, having an asymmetric karyotype.

REFERENCES

1. CIOCĂRLAN V. 2001. *Flora ilustrată a României*. București, Edit. Ceres: 1138 pp.
2. FEDOROV A. 1969. *Hromozomânâe cîsla tvetcovâh rasteinii*. Leningrad, Academia Nauk: 1250 pp.
3. RAICU P. & al. 1983 - *Genetica*. București, Edit. Academiei Române: 386 pp.
4. TIȚĂ I. 1984 - *Cercetări citogenetice la speciile genului Vicia, în special la cele cu importanță economică*. Teză de doctorat, Universitatea București: 170 pp.