MITOTIC CHROMOSOMES STUDIES IN AROMATIC PLANTS: 1. *CARUM CARVI* (2N = 20)

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Abstract: Our study is focused on *Carum carvi* karyotype, as a part of an extended project of our laboratory, project concerning plants karyotypes.

INTRODUCTION

Diversification and improvement of the species, evolution, can be observed first of all at chromosomal level. The chromosomes number and type's changes, due to aneuploidy, polyploidy, interspecific hybridization or simply to the restructurations by deletions, inversions, duplications and translocations can be easily distinguished by cytogenetic analysis. On the other hands, karyotyping represents an important step in investigation and characterization of any vegetal and animal species.

THE AIMS OF INVESTIGATION

Our study intends to determine karyotype of an aromatic plant – *Carum carvi*. Our data represent a part of an extended project of our laboratory, project concerning plants karyotypes.

MATERIALS AND METHODS

Carum carvi seeds: cultivar from Agrosem Center Iasi. This cultivar is well characterized as productivity, soil and water requirements.

Laboratory phase: germination in Petri dishes, on filter paper wetted with distilled water, at room temperature, in the dark. When roots achieved 1 – 2cm length, the material was removed out and colchicines 0,2% treated for 2 hours, then fixed in Carnoy fixator, for 24 hours. All subsequent steps were performed according literature (Bara, 1993; Marc et al., 2002). The staining was performed with Carr (modified Schiff reactive) (Cimpeanu et al., 2002). Photography was taken with a Nikon Eclipse 600 bright field microscope, with a digital camera CoolPix Nikon. Images were Adobe Photoshop 5.0 processes.

RESULTS AND DISCUSSIONS

In all analyzed mitotic metaphases the chromosome number of *Carum carvi* was 20 (2x=20) according literature data.

The biometric study of the karyotype settled on arms ratio, arms difference, centromeric index and relative length it comes out that: there are 8 chromosomes pairs with median centromeric region (M type) and 2 pairs with sub median morphology (sm type).

The longest chromosome has 4,09µm and the shortest 2,93µm length. Centromeric index exhibits values between 46,67% and 30,93%.

The decrease of length was of 0,57µm between first and second pairs, 0,05µm between third and fourth pairs and 0,21µm between ninth and tenth pairs.

Pairs V and VI have the same total length (3,23µm). This situation can be observed also in VII, VIII and IX pairs (3,14µm).

The arm ratio for chromosomes III and VII was 1,91 and 1,76. This is the reason for establish these chromosomes type as sub median.

In the first pair we found satellites with 0,68µm length, but there is also a visible length difference between these two chromosomes from first pair, difference probably due to a translocation.

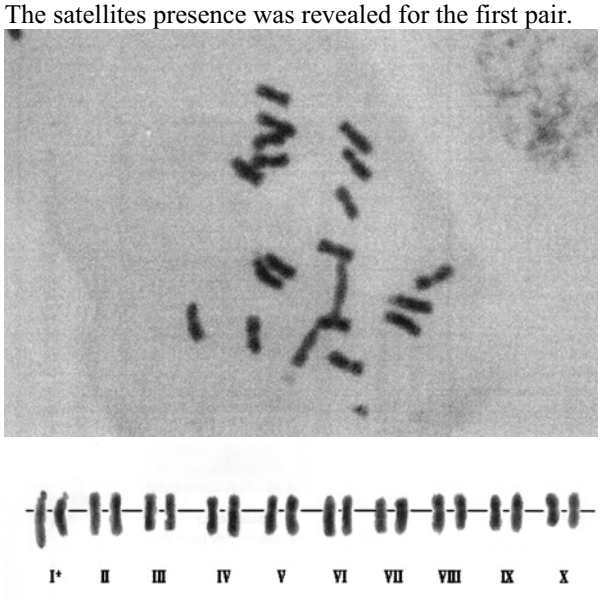
Our study reveals the primitive aspect of *Carum carvi* karyotype, according the principles of symmetry and asymmetry of karyotypes (Stebbins, 1971)

CONCLUSIONS

Chromosome number in *Carum carvi* is 20.

The chromosomes are sub median (third and seventh pairs) or median, in respect to their centromeric regions position.

The satellites presence was revealed for the first pair.



Metaphase (up) and karyotype (down) at *Carum carvi*.

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Table I Chromosomes characteristics at *Carum carvi*

Pair	Type	Total length (μm)	Short arm (μm)	Long arm (μm)	Arms ratio	Centromeric index %	Relative length %	Satellites (μm)
I	**M**	4,09	1,55	1,83	1,18	37,89	12,38	0,68
II	**M**	3,52	1,62	2,04	1,25	46,02	10,65	
III	**sm**	3,33	1,13	2,16	1,91	30,93	10,08	
IV	**M**	3,28	1,34	1,94	1,44	40,85	9,93	
V	**M**	3,23	1,39	1,87	1,34	43,03	9,77	
VI	**M**	3,23	1,54	1,83	1,18	47,67	9,77	
VII	**sm**	3,14	1,23	2,17	1,76	39,17	9,50	
VIII	**M**	3,14	1,45	1,94	1,33	46,17	9,50	
IX	**M**	3,14	1,40	1,75	1,25	44,58	9,50	
X	**M**	2,93	1,35	1,61	1,19	46,07	8,87	