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Karyotype analysis in two varieties of *Iberis amara* L. collected from Jharkhand

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Abstract : Somatic chromosome number and detailed karyotype analysis were carried out in two varieties of *Iberis amara* L. viz. Hyacinth flowered and Iceberg which is available in Jharkhand. The somatic chromosome number was reconfirmed in *Iberis amara* L. i.e 2n= 14.

Key Words: Iberis amara L., Hyacinth, Iceberg, Somatic, Karyotype, Jharkhand.

INTRODUCTION

Iberis amara L. Commonly known as bitter candytuft or annual candytuft belongs to family cruciferae, subtribe , Iberidinae¹. It is an annual, folacious plant 2-4 inches in height and native to Britain and northern countries of Europe. In India it is mainly grown in gardens during winter season as an ornamental plant for its beautiful white flower. Since ancient times this plant has been used as herbal medicine, it is demulcent, in chronic catarrh, chronic dysentery, and diarrhoea and as a tonic in dyspepsia, convalescence, and in enlargement of heart. It is also used in rheumatism, gout and homeopathic tinctures. In the present work the karyotype analysis on two varieties of Iberis amara L. have been performed. Earlier cytological observation on chromosome count was made² in year 1928 which gave haploid chromosome number of Iberis *amara* L. n=8. The diploid chromosome number in *Iberis* amara L. 2n = 14 which was also confirmed ³⁻⁵.

MATERIALAND METHODS

Seeds of two varieties of *Iberis amara* L. mainly var. Hyacinth flowered and var. Iceberg was collected from

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Birsa Agricultural University, Kanke, Ranchi and local nurseries. Mitotic studies were performed from the cells of ovary walls. Young bud of the plant were collected and fixed in 1:3 acetoalcohal for 24 hrs. Ovaries of the buds were warmed in 2% acetocarmine and slides were prepared by squash techniques. 10 well separated metaphase plates were studied under microscope in high magnification and microphotograph was taken .

RESULT AND DISCUSSION

The data for cytotaxonomical studies are depicted in Table 1 and are represented by Fig 1-5. Basic chromosome number of 2n=2x=14 were observed in both varieties of *Iberis amara* L. Hyacinth flowered and Iceberg. The total chromatin length (TCL) observed was 2.07 μ and 1.33 μ in the variety Hyacinth flowered and Iceberg respectively. The variety hyacinth flowered has got the maximum TCL.

The var. Hyacinth flowered consists with 2nm and 5nsm chromosomes and var. Iceberg has 2st, 1nm, 4nsm chromosomes. Maximum numbers of nsm were reported in both the varieties. Only 1 nm chromosome was observed in iceberg variety of *Iberis amara* L. Among the two varieties studied no telocentrics were observed only two sub telocentric chromosomes were found in the variety Iceberg.

In the present finding the chromosome size ranged

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between 0.22µ - 0.44µ in hyacinth flowered variety which was much smaller than the chromosome length earlier recorded ⁶. The reason might be the environmental effect on chromosome. The haploid compliment shows nearly median, nearly submedian and sub terminal chromosome. This indicates the symmetrical nature of the karyotype ⁷⁻⁸ which is in accordance with the earlier findings ⁹. The morphologically primitive members are with symmetrical karyotype whereas advanced members are with asymmetrical karyotype ¹⁰. Among the two varieties var. Iceberg having asymmetrical nature of karyotype is considered advanced (Fig 5) and var. Hyacinth flowered as primitive as it has symmetrical nature of karyotype (Fig 6). Species and varieties having greater number of submedian and telocentric chromosomes are considered

advanced and those with lesser number of sub metacentric and telocentric as primitive ¹¹. In present finding var. Iceberg is considered as advanced because it has four nearly sub median chromosome and two sub terminal chromosome and var. Hyacinth as primitive as there is no telocentric chromosome and two chromosomes are nearly metacentric.

While considering the TCL, it is fond that var. Hyacinth has the maximum chromatin length indicating it the primitive and var. Iceberg with minimum chromatin length as advanced. Difference in TCL may be due to loss of translocated segments formed during asymmetrical change.

Varieties under		Arm Length	Arm Length	Chromosome	Arm ratio	
consideration	Chromosome	Long arm(µ)	Short arm(µ)	Length	L/S (µ)	Classification
	Ι	0.23 ± 0.004	0.17 ± 0.02	0.40± 0.02	1.42 ± 0.15	NM
<i>Iberis amara</i> L. var Hyacinth Flowered	II	$0.22\!\pm 0.004$	0.15 ± 0.02	$0.37{\pm}~0.02$	$1.59{\pm}~0.19$	NM
	III	$0.21\!\pm\!0.01$	$0.09{\pm}~0.02$	$0.29{\pm}~0.02$	$4.01{\pm}~1.80$	NSM(+)
	IV	$0.19{\pm}0.01$	$0.10{\pm}~0.01$	$0.29{\pm}~0.01$	$2.03{\pm}~0.33$	NSM(-)
	V	$0.18 {\pm} 0.01$	$0.09{\pm}~0.01$	$0.26{\pm}~0.02$	$2.17{\pm}~0.23$	NSM(-)
	VI	$0.15\!\pm\!0.02$	0.09 ± 0.02	0.24 ± 0.04	2.98 ± 1.51	NSM(-)
	VII	$0.15\!\pm\!0.02$	0.07 ± 0.02	0.22 ± 0.03	3.64 ± 1.44	NSM(+)
Total Haploid				2.07		
Chromosome Length						
<i>Iberis amara</i> L. var. Iceberg	Ι	0.18 ± 0.01	0.08 ± 0.03	0.27± 0.03	6.03±3.61	NST(-)
	II	0.15 ± 0.01	0.11 ± 0.002	0.27 ± 0.02	1.37 ± 0.12	NM
	III	0.13 ± 0.01	$0.07 {\pm}~ 0.02$	0.20± 0.03	2.57 ± 0.68	NSM(-)
	IV	$0.11\!\pm\!0.01$	$0.07{\pm}~0.02$	0.18 ± 0.02	2.70 ± 0.94	NSM(-)
	V	$0.10\!\pm\!0.004$	$0.06{\pm}~0.01$	0.17 ± 0.02	2.11 ± 0.62	NSM(-)
	VI	$0.09 {\pm} 0.01$	$0.05{\pm}~0.02$	$0.14{\pm}~0.02$	$4.38{\pm}~1.91$	NST(-)
	VII	$0.08 {\pm} 0.01$	$0.02{\pm}~0.01$	0.10 ± 0.01	2.20 ± 1.13	NSM(-)
Total Haploid Chromosome Length				1.33		

Table 1. Kai yomoi phoiogical uata of two varieties of <i>theris umuru</i>	Table	e 1:	Karyo	morpho	logical	data o	f two	varieties	of Iberis	s amara	I
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Fig.1













Fig.1- 6. 1. Iberis amara L. var Hyacinth flowered (flower) 2. Iberis amara L. var Iceberg (flower). 3.
Mitotic Metaphase var Iberis amara L. Hyacinth. 4. Mitotic Metaphase var Iberis amara L. Iceberg 5.
Idiogram of Iberis amara L. Var. Hyacinth 6. Idiogram of Iberis amara L.var. Iceberg

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