

(Trigonella foenum- graecum)

(Trigonella foenum-graecum L.)

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Trigonella foenum- L.)

(*graecum*)

Trigonella

T. foenum-graecum

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(*Matricaria recutita L.*)

(*Salvia officinalis L.*)

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(*Artemisia sieberi L.*)

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$C_{13}H_{16}F_3N_3O_4$

2,6-dinitro-N,-dipropyl-4-

(trifluoromethyl)benzenamine

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(\ddot{y})

Ilex paraguariensis

T. foenum-graecum

(\ddot{y}) () ()

F₁

m + sm *T. foenum-graecum*

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n= + B

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n=

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BH-2 Digital

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Color Video

Camera, Olympus

(SSC, DC18P

Color Video Camera

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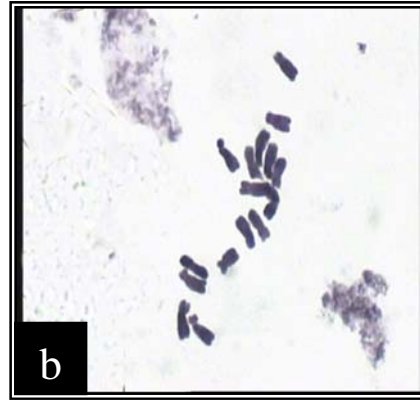
M	Median point	
m	Median region	/ \hat{c} - /
sm	Submedian region	/ \hat{I} - \hat{e} /
st	Subterminal region	- /
t	Terminal region	\hat{I} - /
T	Terminal point	\hat{I}

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(X=) *T. foenum-graecum*



T. foenum-graecum

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x

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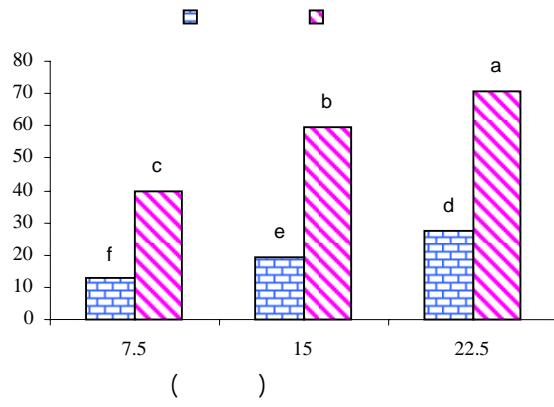
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x

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x -é

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a -)

(b ()

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(c -)

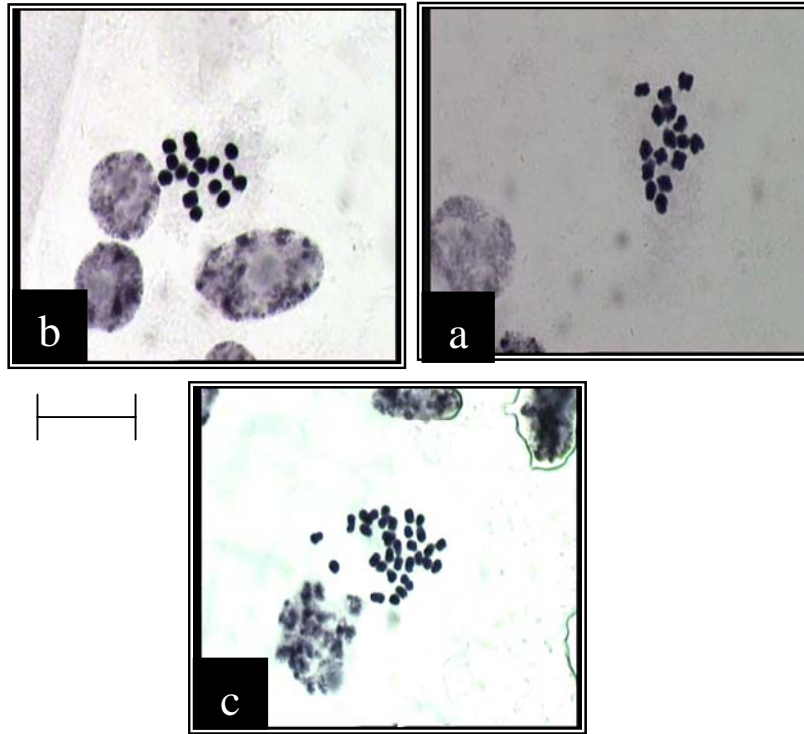
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T. foenum-graecum

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2n=16	
2n=4x=32	

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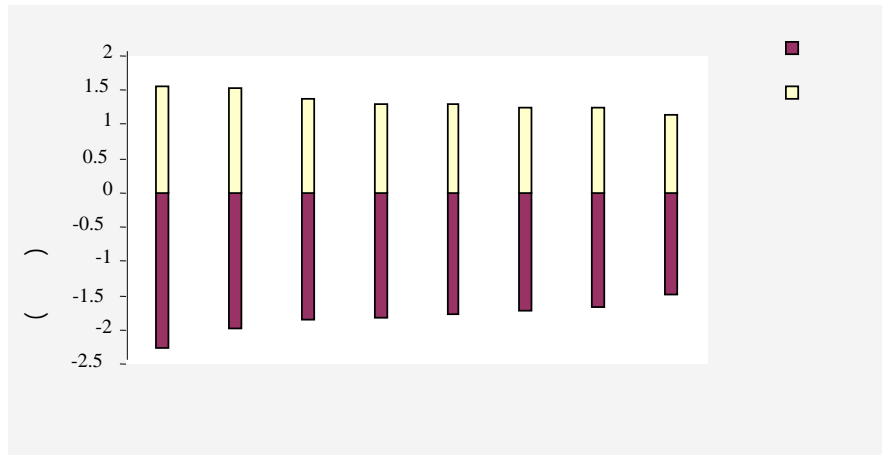
m)
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$$\epsilon_n = \epsilon_x =$$

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	(μm)	(μm)	(μm)			
	é/é	î/î	é/é	è/è	ç/è	m
é	/	î	î	/ç	ç/èè	m
	/	/	é/è	/î	ç/è	m
è	/	/ç	/	è/ç	ç/èè	m
î	î	é/è	ç/î	/	ç/èè	m
	î	é/è	é/	/	ç/èè	m
î	/	é/è	é/	é/é	ç/è	m
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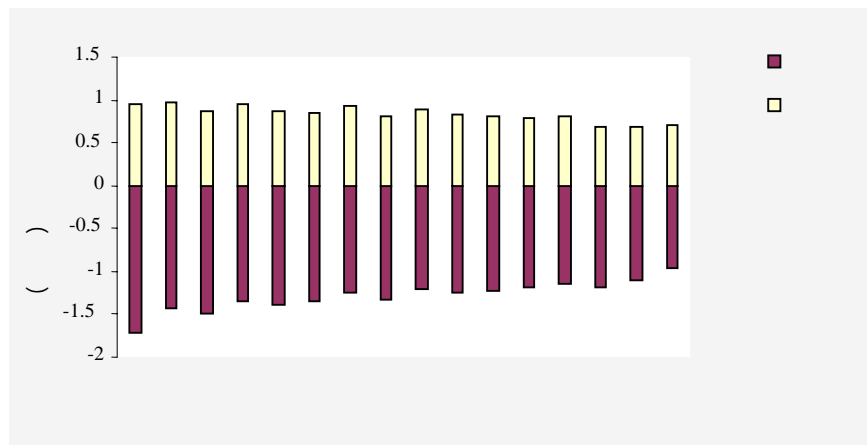
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Én=Ēx= é

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	(µm)	(µm)	(µm)			
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è	/ î	ç î	é	/è é	çè	m
î	/	ç î	éëë	/î	ç	m
	/ î	ç î	éé	/î	ç	m
î	/éë	ç	é î	/ è	çè	m
	/ é	ç ç	é é	/ è	ç	m
	/éç	ç	éç	/ î	çè	m
ç	/éë	ç	éçî	/î ç	çéç	m
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è	/	ç	/ î	/î	ç î	sm
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	ç î	çî	/	/ î	çè	m



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(X)

	(μm)	(μm)	(μm)	(μm)	X	n
m+ sm	$l\ddot{y}$	$l\ddot{y}$	$l\ddot{y}$	$\ddot{y}l$		n= x=
m	l	l	l	l		n= x=
m+ sm	l	l	l	l		n= x=

:m sm

(i)

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\ddot{y}/\dot{y} **	$/ \ddot{y}^{**}$	$/ **$	$/ **$	$/ **$	
\ddot{y}/\dot{y}	$\ddot{y}/$	$/\ddot{y}$	$/$	$/ \ddot{y}$	
$/$	$/$	$/$	$/$	$/$	()

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\ddot{y}/ \dot{y}^c	$/^a$	$/^a$	$/^a$	$/\dot{y}^a$	()
$\ddot{y}/^a$	$/^c$	$/^b$	$/^b$	$/^b$	
$\ddot{y}/^b$	$/^b$	$\ddot{y}/^c$	$/^c$	$/^c$	

.(\ddot{y})
(\ddot{y})

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Effect of Trifluralin Herbicide on Polyploidy Induction and Chromosome Changes in Root Meristem Cells of Fenugreek (*Trigonella foenum-graecum*)

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Abstract

Fenugreek (*Trigonella foenum-graecum*) is an annual herbaceous plant belongs to Papilionaceae family and is important as a pharmaceutical, agronomic and pastoral plant. In order to study the effect of trifluralin on ploidy induction and cytogenetic characteristics of cells in the root meristem of fenugreek some seeds of this species were planted in the incubator and after germination root tips were used for karyotypic studies. For treating the seeds trifluralin liquid 48% were applied at 7.5, 15 and 22.5 μM concentrations for 12 and 24 h. The Video Analysis System was used for karyotype analysis. The basic chromosome number was $X=8$. The results showed that concentration of trifluralin, treatment duration and interaction between them on the ploidy induction were statistically significant. The maximum ploidy induction was happened by immersion seedlings in 22.5 μM trifluralin at 24 h. The result of analysis of variance based on completely randomized design (CRD) showed a significant difference among the karyotypes for all chromosomal traits ($P<0.05$). Trifluralin affected severity on the length of chromosomes and karyotypic formula so that the longest chromosomes belonged to the karyotype control sample and the shortest chromosomes were observed after treating with trifluralin. After applying treatment was reduced the percentage of submetacentric chromosomes and were added to the percentage of metacentric chromosomes.

Keywords: Chromosome, Cytogenetic changes, Ploy Ploidy induction, Trifluralin, Fenugreek

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