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The XXI International Grassland Congress / VIII International Rangeland Congress took place in Hohhot, China from June 29 through July 5, 2008.

Proceedings edited by Organizing Committee of 2008 IGC/IRC Conference

Published by Guangdong People's Publishing House

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The effects of seeds irradiation with ^{60}Co - γ ray on seed germination and chromosome of *Melilotoides ruthenica*(L.) Sojak cv. Zhilixing

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Key words : *Melilotoides ruthenica* L . , ^{60}Co - γ , mutation , seed germination , karyokinesis

Introduction *Melilotoides ruthenica*(L.) Sojak cv. Zhilixing is diploid ($2n=16$) . It has many excellent characters including upstanding stem , earliness and good quality . It has also strong cold and drought resistance , salt and alkali tolerance . But compared with other legumes , it has a lower output .

Materials and methods The seeds of *Melilotoides ruthenica*(L.) Sojak cv. Zhilixing were irradiated with different dosages of 600Gy , 800Gy , 1000Gy , 1200Gy and 1400Gy . The materials were from a farm in Inner Mongolia Agricultural University . we broke the hard seeds by knife , then made irradiated seeds and not irradiated seeds germinate and counted germinated ratio in programmable illuminated incubator in 25°C . We counted characters of chromosome of metaphase in karyokinesis by different dosages with method in knocking slice of chromosome of root tip cells when root tip grew to 1-3 cm .

Results (1) the speed of seed's germination is faster than not irradiated . The germinated ratio by irradiated is lower than not irradiated when germination is at 24 hours . This phenomenon increases continuously with the increase of different dosages . But after germination is at 48 hours , most of seeds can germinate and the germinated ratio can reach 95% or higher . (2) With the increasing of different dosages , the time of metaphase in karyokinesis is postponed continuously (Table 1) . (3) The number and absolute length of chromosome by 1200Gy has obvious diversity comparing with other four dosages and not irradiated .

Table 1 Effects of chromosome on metaphase in karyokinesis of *Melilotoides ruthenica* (L.) Sojak cv. Zhilixing by different dosages of ^{60}Co - γ ray .

	Not irradiated	600Gy	800Gy	1000Gy	1200Gy	1400Gy
t (hour :minute)	9 :00-9 :15	9 :15-9 :17	9 :15-9 :17	9 :20	9 :25	9 :25
b \leq 2 μm (%)	0	0	0	0	69%	0
2 $<$ b \leq 3 μm (%)	68%	31%	40%	64%	15%	12 .5%
b $>$ 3 μm (%)	32%	69%	60%	36%	16%	87 .5%
y (%)	100	100%	98%	100%	89%	100%
	16	50%	60%	41%	44%	58%
	22-32	0	0	2%	0	11%

(t : time of metaphase in karyokinesis b : the length of chromosome y : the number of chromosome)

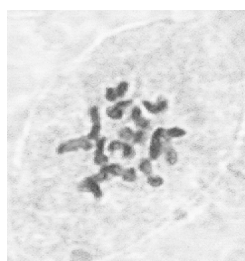


Figure 1 Shape of chromosome in not irradiated .

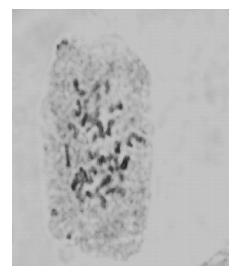


Figure 2 Shape of double chromosome by 1200Gy .

Conclusions (1) the speed of seed germination is affected by different dosages of ^{60}Co - γ . But the germinated rate is not changed finally . (2) At 1200Gy irradiation , it can be found the mutation of chromosomes which generates genetic variation . (3) Whether the discover of mutations can bring advantaged effects on production by 1200Gy ? This question will be answered in farther experiments .

Reference

C .GUAN , C .LIU , (2006) , High oleic acid content breeding materials of Brassica napus produced by ^{60}Co radiation . *genetics and breeding* ,11 ,155-158 .