

---

\*

( // / : // / : )

*T. lappaceum*, *T. grandiflorum*, *T. repens*, *T. campestre*, *Trifolium dasyurum*,

*T. resupinatum*

Micromeasure

(CI) (AR) (TL) (LA) (SA)

DRL %TF A<sub>2</sub> A<sub>1</sub>

*T. repens*

A

Stebbins

%

UPGMA

*T. repens* *T. grandiflorum* *T. resupinatum* *T. campestre*

*T. resupinatum* *T. campestre*

*T. dasyurum*

*lappaceum*

*T. dasyurum* *T. campestre*

:



( ) Sheidai, et al.

*T. resupinatum*

*T. pratense*, *T. repens*, *fragiferum*

*alexandrinum* ( )

n=

n=

X=

X=

( )

UPGMA WARD

, *Kordestan*, *Lordegan*, *Shazand*

*T. resupinatum* *Enag*

*Soriyan Harati*

( )

*T. fragiferum alexandrinum* ( Ansari et al.,1999)

Yuxi

*T. fragiferum*

n= x=

( ) Abdelguerfi Issolah

*T. scabrum*

n= x=

n =

n=

(Anon, 1993) /

( ) Carine, et al .

( ) Darlington (Sheidai et al .,1998)

*T. fragiferum*

*T .repens* n=

n= *T. scabrum* n=

---

/

-  $\alpha$

( n= x= )

( n= x= )

NaOH

:

Color Video Camera

Photoshop

( )  
CCD

Micromasure  
X

( )  
( )

( )

(TL)

(LA)

(SA)

(CI)

(AR)

%TF A<sub>2</sub> A<sub>1</sub>

DRL

%

...

n=

n=

UPGMA

( ) Darlington . X= X=

n= *T. repens*

n= *T. scabrum*

*T.*

n= *repens*

*T. dasyurum*

*T. repens*

%TF

A

Stebbins

*T.*

*T.*

( /  $\mu\text{m}$ ) *dasyurum*

( /  $\mu\text{m}$ ) *repens*

%

*T.*

*T.*

( /  $\mu\text{m}$ ) *dasyurum*

( /  $\mu\text{m}$ ) *repens*

( X= )

(1999) Ansari, et al.

A<sub>2</sub> A<sub>1</sub>

*T. campestre*

%TF

*T. dasyurum*

( )

) A<sub>1</sub>

(

) A<sub>2</sub> DRL

(

n= x = *T. dasyurum*

, *T. lappaceum*, *T. grandiflorum*

*T.*

n= x = *T. resupinatum*

*l.*

n= x = *repens*

( ) Sheidai, et a

*T. fragiferum*

*T. resupinatum*

*T. alexandrinum* *T. pratense*, *T. repens*,

( )

*T. campestre*

Kordestan , Lordegan , Shazand  
*T. resupinatum* Enag ,  
 Soriyan Harati

*T. repens T. grandiflorum T.resupinatum*  
*T. lappaceum*  
*T .dasyurum*

*T.*  
*T. fragiferum T. alexandrinum*  
*T. resupinatum campestre*  
*dasyurum T. campestre*

*T.*

*T. fragiferum*

UPGMA WARD

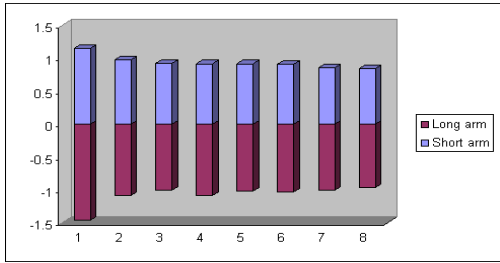
( )

	VRC	%TF	DRL	SC	A <sub>2</sub>	A <sub>1</sub>	X	2 n			
m	/	/	/	1A	/	/		2 n =1			<i>T. campestre</i>
m	/	/	/	1A	/	/		2 n =1			<i>T. dasyurum</i>
m	/	/	/	1A	/	/		2 n =16			<i>T. grandiflorum</i>
m	/	/	/	1A	/	/		2 n =1			<i>T. lappaceum</i>
m	/	/	/	1A	/	/		2 n =1			<i>T. resupinatum</i>
m	/	/	/	1A	/	/		2 n =32			<i>T. repens</i>

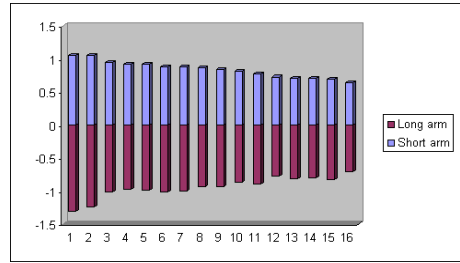
:A1  
 :DRL :A2  
 :VRC stebbins :SC

( )

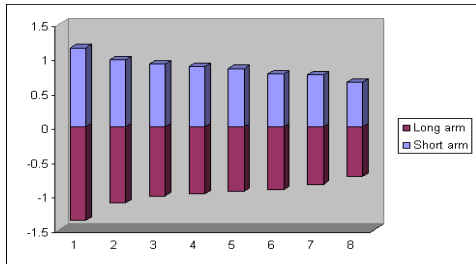
<i>T. scabrum</i> L.			Nielsen
<i>T. tembense</i> Fres.			Thulin
<i>T. squarrosus</i> L.			Fernandes, Santos & Queiros
<i>T. tomentosum</i> L.			Fernandes, Santos & Queiros
<i>T. smyrnaeum</i> Boiss.			Fernandes & Queiros
<i>T. squarrosus</i> L.			Fernandes & Queiros
<i>T. patens</i> Schreb.			Quriros
<i>T. pratense</i>			Sheidai, et al
<i>T. repens</i> L.			Sheidai, et al
<i>T. scabrum</i>			Issolah & Abdelguerfi



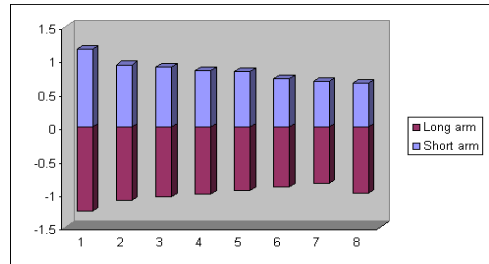
*T. resupinatum*



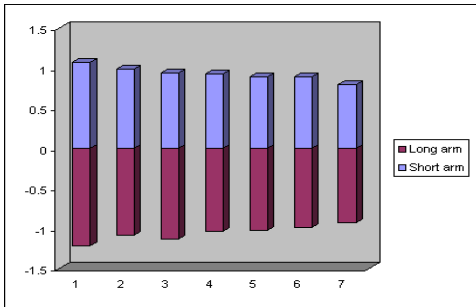
*T. repens*



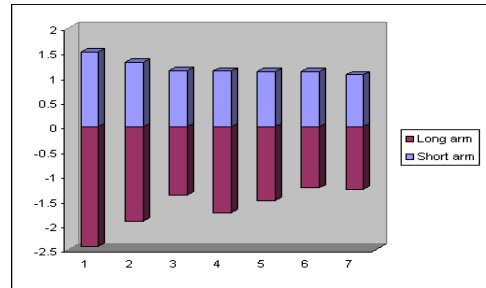
*T. grandiflorum*



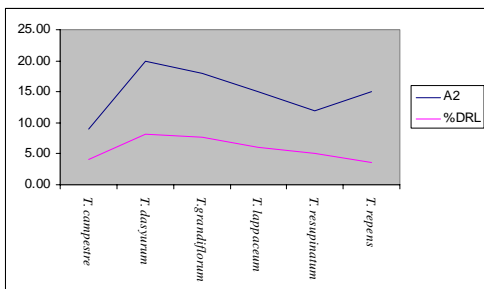
*T. lappaceum*



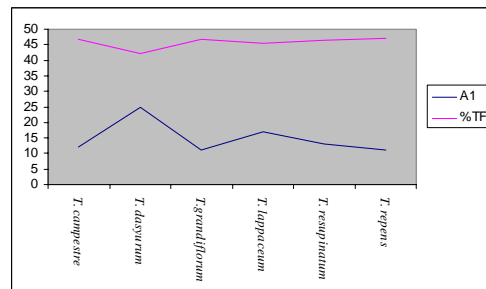
*T. campestre*



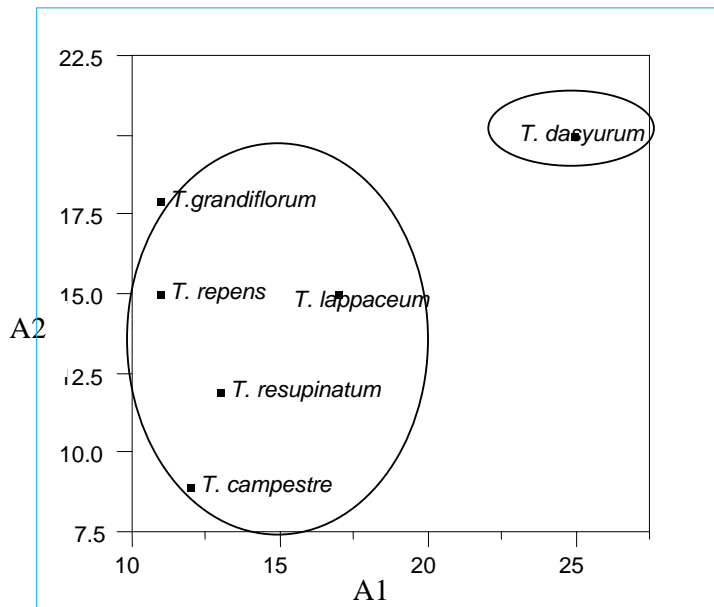
*T. dasyurum*



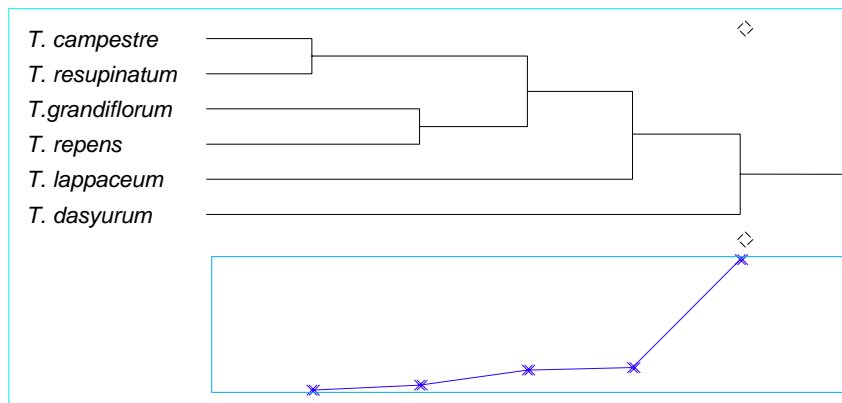
A<sub>2</sub> DRL



A<sub>1</sub> %TF

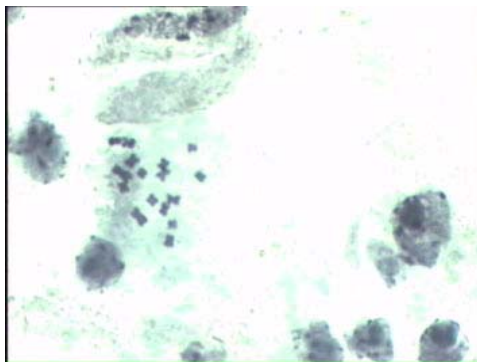


A<sub>2</sub> A<sub>1</sub>

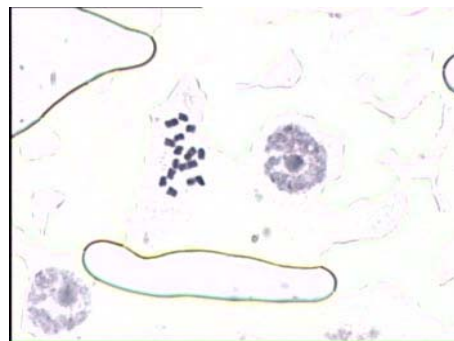


UPGMA

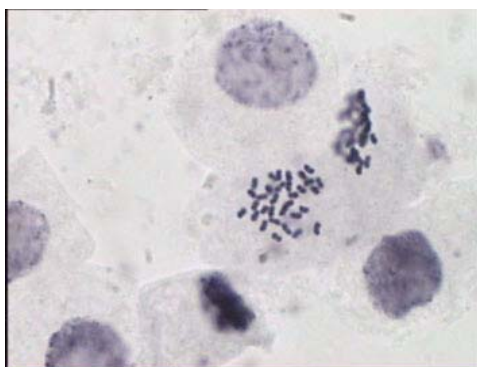




*T. grandiflorum*



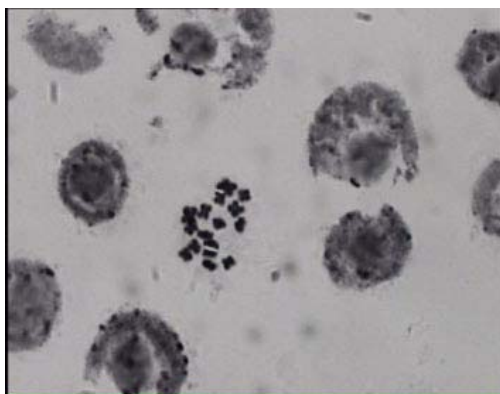
*T. lappaceum*



*T. repens*



*T. campestre*



*T. resupinatum*



*T. dasyurum*

- 
- 3- Anon. 2004. The biology and ecology of white clover ( *Trifolium repens* L. ) in Australia. Australian Government Department of health and ageing office of the gene tecnology regulator.1-20.
  - 4- Ansari , H.A. , N.W. Ellison , S.M. Reader , E.D. Badaeva , Bernd Friebe , T.E. Miller and W.M. Williams. 1999. Molecular Cytogenetic Organization of 5S and 18S-26S rDNA Loci in White Clover (*Trifolium repens* L.) and Related Species. *Annials of Botany*. 83: 199-206.
  - 5- Carine, S.I., M. Teresa., S.CH. Wittman and M.I. Agnol. 2006. Sexual polyploidization in Red clover. *Sience Agriculture*. 63.1 26-31
  - 6- Darlington, C.D. and A.P. Wylie. 1976. *Chromosome Atlas of Flowering Plants*. London. George Allen & Unwin LTD.900 PP.
  - 7- Goldblat, Petter. 1970-1978. *Index to plant Chromosome Numbers*. Missouri Botanical Garden.
  - 8- Issolah , R. and A.Abdelguerfi , 1999. Chromosome numbers within some spontaneous population of 10 *Trifolium* species in Algeria. *Caryologia*. 52: 151-154.
  - 9- Sheidai, M. , A. Hamta , A. Jaffari Mofidabadi and M.R. Noori Dalooi , 1998. Karyotype study of *Trifolium* species and cultivars in Iran. *J. Sci . I . R . Iran*. 9: 215-222.
  - 10- Yuxi Agricultural College Annual Report, Luoyang , Henan , China , 1993. Karyotype analysis of *Trifolium pratense* and *T.repens*. *Grassland-of -china*. 3: 65-66.

## Use of Image analysis system to Karyotype of *Trifolium* in Fars province

M. Riasat<sup>\*1</sup>, S. M. Hesam zadeh<sup>2</sup>, S. Sadeghian<sup>3</sup> and A. Hatami<sup>3</sup>

<sup>1</sup> Scientific member, Research Center of Agriculture and Natural Resources of Fars province, I. R. Iran

<sup>2</sup> Scientific member, Research Institute of Forests and Rangelands, I. R. Iran

<sup>3</sup> Expert, Research Center of Agriculture and Natural Resources of Fars province, I. R. Iran

(Received 16 July 2006, Accepted 14 January 2008)

### Abstracts

A karyological study of six species: *Trifolium campestre*, *T. dasyurum*, *T. grandiflorum*, *T. lappaceum*, *T. resupinatum*, and *T. repens* is presented. We used Video Analysis system for each species with Micromeasure software. Some features of chromosome such as SA, LA, TL, AR and CI were determined. For assignment of evolutionary situation of all species, except *T. repens* that was tetraploid others were diploid and we found the two basic number in the genus:  $x=7,8$ . we determine karyotype symmetric parameters such as A1, A2, %TF and DRL. The data for all traits on each species were analyzed as RCD experiment and the results showed all species had significant difference for all traits at %1. This results were expressed variation chromosomes in all species. Using Stebbins method karyotypical characters were identified and it was shown that all of species are in 1A class.. Finally the 6 species were grouped in to 3 cluster.

**Keywords:** *Trifolium*, Chromosome, Karyotype, Image analysis system, Cytogenetic, Iran

---

\* Corresponding author: Tel: +98 711 7204115 , Fax: +98 711 7205107 , Email: riasat49@yahoo.com