

1. Molecular characterization of two cultivars of Egyptian clover (*Trifolium alexandrinum* L.)

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Abstract:

Two Egyptian clover cultivars namely 'Fahl' and 'Helaly' were analyzed based on seed soluble protein pattern as well as RAPD, ISSR and AFLP generated DNA profiles. For AFLP analysis, DNA of Egyptian clover cultivars were digested with EcoRI + MseI restriction enzymes. Among the molecular markers used ISSR showed highest level of molecular variance (24.5%). In terms of allele frequency (p), level of difference between two cultivars was variable. Results also indicated that relationship study between two cultivars can be better performed using Cubic, Quadratic model.

Keywords: AFLP; Egyptian clover; Fodder; ISSR; Molecular markers; RAPD; Trifolium

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References

1. Title: Genetic transformation of wheat mediated by *Agrobacterium tumefaciens*
Author(s): Cheng, M; Fry, JE; Pang, SZ; et al.
Source: PLANT PHYSIOLOGY Volume: 115 Issue: 3 Pages: 971-980 Published: NOV 1997
2. Title: [not available]
Author(s): DAN M
Source: MOL BREEDING Volume: 3 Pages: 127 Published: 1997
3. Title: A plant DNA mmipreparation: version II

Author(s): Dellaporta, SL; Wood, J; Hicks, JB.

Source: Plant Mol Biol Reporter Volume: 1 Pages: 19-21 DOI:
10.1007/BF02712670 Published: 1983

4. Title: The use of ISSR and RAPD markers for detecting DNA polymorphism,
genotype identification and genetic diversity among barley cultivars with known origin

Author(s): Fernandez, ME; Figueiras, AM; Benito, C

Source: THEORETICAL AND APPLIED GENETICS Volume: 104 Issue: 5 Pages:
845-851 DOI: 10.1007/s00122-001-0848-2 Published: APR 2002

5. Title: [not available]

Author(s): GARDINIER E

Source: LENINGRAD Volume: 16 Pages: 65 Published: 1988

6. Title: Relating morphologic and RAPD marker variation to collection site
environment in wild populations of red clover (*Trifolium pratense* L.)

Author(s): Greene, SL; Gritsenko, M; Vandemark, G

Source: GENETIC RESOURCES AND CROP EVOLUTION Volume: 51 Issue: 6
Pages: 643-653 DOI: 10.1023/B:GRES.0000024655.48989.ab Published: SEP 2004

7. Title: Variability of storage proteins and esterase isozymes in *Vicia sativa*
subspecies

Author(s): Haider, AS; El-Shanshoury, AR

Source: BIOLOGIA PLANTARUM Volume: 43 Issue: 2 Pages: 205-209 DOI:
10.1023/A:1002791824350 Published: 2000

8. Title: [not available]

Author(s): LAWLER FC

Source: PCR METH APPL Volume: 2 Pages: 275 Published: 2003

9. Title: Mixed grazing and climatic determinants of white clover (*Trifolium repens*
L.) content in a permanent pasture

Author(s): Nolan, T; Connolly, J; Wachendorf, M

Source: ANNALS OF BOTANY Volume: 88 Special Issue: SI Pages: 713-724
DOI: 10.1006/anbo.2001.1493 Published: OCT 2001

10. Title: [not available]

Author(s): RAFALSKI JA

Source: ANAL NONMAMMALIAN GE Published: 1996

11. Title: [not available]

Author(s): RHODES I

Source: REUR TECHNICAL SERIE Volume: 19 Pages: 1 Published: 1991

12. Title: White clover morphology changes with stress treatments

Author(s): Seker, H; Rowe, DE; Brink, GE

Source: CROP SCIENCE Volume: 43 Issue: 6 Pages: 2218-2225 Published:
NOV-DEC 2003

13. Title: A PROCEDURE FOR THE ROUTINE DETERMINATION OF
ELECTROPHORETIC BAND PATTERNS OF BARLEY AND MALT
ENDOSPERM PROTEINS

Author(s): SMITH D B; PAYNE P I

Source: Journal of the National Institute of Agricultural Botany Volume: 16 Issue: 3
Pages: 487-498 Published: 1984

14. Title: Analysis of genetic diversity in red clover (*Trifolium pratense* L.)
breeding populations as revealed by RAPD genetic markers

Author(s): Ulloa, O; Ortega, F; Campos, H

Source: GENOME Volume: 46 Issue: 4 Pages: 529-535 DOI: 10.1139/G03-030
Published: AUG 2003

15. Title: Seed storage protein profile of grain legumes grown in Iran, using SDS-
PAGE.

Author(s): Valizadeh, M.

Source: Journal of Agricultural Science and Technology Volume: 3 Issue: 4 Pages:
287-292 Published: 2001

16. Title: AFLP - A NEW TECHNIQUE FOR DNA-FINGERPRINTING

Author(s): VOS, P; HOGERS, R; BLEEKER, M; et al.

Source: NUCLEIC ACIDS RESEARCH Volume: 23 Issue: 21 Pages: 4407-4414
DOI: 10.1093/nar/23.21.4407 Published: NOV 11 1995

17. Title: DNA POLYMORPHISMS AMPLIFIED BY ARBITRARY PRIMERS
ARE USEFUL AS GENETIC-MARKERS

Author(s): WILLIAMS, JGK; KUBELIK, AR; LIVAK, KJ; et al.

Source: NUCLEIC ACIDS RESEARCH Volume: 18 Issue: 22 Pages: 6531-6535
DOI: 10.1093/nar/18.22.6531 Published: NOV 25 1990

18. Title: Selective restriction fragment amplification: A general method for DNA
fingerprinting Patent Number: 92402629.7

Inventor/Assignee: Zabeau, M.; Vos, P.

Source: European Patent Application Published: 1993

2. Cytological comparison of two cultivars of Egyptian clover (*Trifolium alexandrinum* L)

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Abstract:

Cytological studies including chromosome number and karyotype analysis have been carried out on two cultivars 'Helaly' and 'Fahl' in Egyptian clover (*Trifolium alexandrinum* L.). The somatic chromosome counts for two cultivars were $2n = 16$. Karyotype analysis showed differences in chromosome morphology. Chromosomes nsm (+) were observed in cultivar Helaly. The karyotype formula for Helaly was $2\text{ nsm (+)} + 2\text{ nsm (-)} + 12\text{ nm}$. For Fahl, $6\text{ nsm (-)} + 10\text{ nm}$ were recorded. Helaly had highest A1 and A2 where Fahl had highest TF %, S%, Syi index and Rec index. Karyotype analysis revealed that cultivar Helaly is advanced one whereas cultivar Fahl is primitive. Chromosomal abnormalities were observed at mitotic division, which was higher in cultivar Fahl.

Keywords: Chromosomal abnormalities; Chromosome number; Fahl; Fodder; Helaly; Karyotype analysis; *Trifolium alexandrinum*

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References

1. Title: [not available] Author(s): BIR SS
Source: RECENT RES PL SCI NE Volume: 7 Pages: 252 Published: 1979
2. Title: A NEW TECHNIQUE FOR ORCEIN BANDING WITH ACID TREATMENT

Author(s): CHATTOPADHYAY, D; SHARMA, AK
Source: STAIN TECHNOLOGY Volume: 63 Issue: 5 Pages: 283-287 Published:
SEP 1988

3. Title: [not available]Author(s): ELNAHAS AI
Source: EGYPT J BIOTECHNOL Volume: 7 Pages: 276 Published: 2000

4. Title: MITOTIC INHIBITION AND CHROMOSOMAL ABERRATIONS
INDUCED BY SOME ARYL ARSONIC ACIDS AND ITS COMPOUNDS IN ROOT
TIPS OF MAIZE

Author(s): EL-SADEK L M
Source: Egyptian Journal of Genetics and Cytology Volume: 1 Issue: 2 Pages: 218-
224 Published: 1972

5. Title: C-BANDED KARYOTYPES IN SCILLA-HOHENACKERI GROUP,
SCILLA-PERSICA, AND PUSCHKINIA (LILIACEAE)

Author(s): GREILHUBER, J; SPETA, F
Source: PLANT SYSTEMATICS AND EVOLUTION Volume: 126 Issue: 2 Pages:
149-188 DOI: 10.1007/BF00981669 Published: 1976

6. Title: KARYOTYPIC STUDIES IN GENUS CROTALARIA LINN
Author(s): GUPTA, R; GUPTA, PK
Source: CYTOLOGIA Volume: 43 Issue: 2 Pages: 357-369 Published: 1978

7. Title: [not available]Author(s): HAMOUD MA
Source: P 6 AR PEST C TANT U Volume: 1 Pages: 435 Published: 1985

8. Title: KARYOTYPE ANALYSIS IN SOME GENERA OF COMPOSITAE .8.
FURTHER STUDIES ON CHROMOSOMES OF ASTER

Author(s): HUZIWARA, Y
Source: AMERICAN JOURNAL OF BOTANY Volume: 49 Issue: 2 Pages: 116-&
DOI: 10.2307/2439026 Published: 1962

9. Title: [not available]Author(s): KAMEL EA
Source: COMP NEWS 1 Volume: 33 Pages: 1 Published: 1999

10. Title: Acetic-orcein: A new stain-fixative for chromosomes
Author(s): La Cour, L
Source: STAIN TECHNOLOGY Volume: 16 Issue: 4 Pages: 169-174 Published:
OCT 1941

11. Title: Meiotic behaviour of chromosomes in PMCs and karyotype of *Trifolium
repens* L. from Darjeeling Himalaya

Author(s): Majumdar, S; Banerjee, S; De, KK

Source: ACTA BIOLOGICA CRACOVIENSIA SERIES BOTANICA Volume: 46

Pages: 217-220 Published: 2004

12. Title: The karyotype in taxonomy.

Author(s): Moore, D. M.

Editor(s): HEYWOOD, V. H.

Source: Modern methods in plant taxonomy. Pages: 61-75 pp. Published: 1968

Publisher: Academic Press, London & New York.

13. Title: Meiotic chromosome studies in Solanaceae from Argentina

Author(s): Moscone, Eduardo A.

Source: Darwiniana (San Isidro) Volume: 31 Issue: 0 Pages: 261-297 Published: 1992

14. Title: MicroMeasure: A new computer program for the collection and analysis of cytogenetic data

Author(s): Reeves, A

Source: GENOME Volume: 44 Issue: 3 Pages: 439-443 DOI: 10.1139/gen-44-3-439 Published: JUN 2001

15. Title: The mutagenic potentialities of some herbicides using *Vicia faba* as a biological system. Author(s): Soliman, M. I.; Ghoneam, G. T.

Source: Biotechnology Volume: 3 Issue: 2 Pages: 140-154 Published: 2004

16. Title: A NEW METHOD FOR ESTIMATING KARYOTYPE ASYMMETRY

Author(s): ZARCO, CR

Source: TAXON Volume: 35 Issue: 3 Pages: 526-530 DOI: 10.2307/1221906
Published: AUG 1986

3. Cytogenetical studies on achene colour polymorphism of *Picris asplenoides* L. and *Urospermum picroides* L. (Asteraceae) in Egypt.

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ABSTRACT

Achene morphs of *Picris asplenoides* L. and *Urospermum picroides* L. were investigated in order to gain insight into its genetic variation based on the evidence obtained from karyotype analysis, electrophoretic pattern of achene proteins as well as nucleic acid analysis. In *Picris asplenoides* L., three achene morphs were observed from every inflorescence as follows: violet, brown and white, these morphs differ in their color. In the inflorescence of *Urospermum picroides* L., three achene morphs were differ also in their color were observed as follows: white, brown and black. All achene morphs of *Picris asplenoides* and *Urospermum picroides* were diploid, with ten chromosomes observed in somatic cells. Karyotype studies showed that the achene morphs of *Picris asplenoides* and *Urospermum picroides* have different karyotype formulae. However, the chromosome type nearly submetacentric (-) and nearly metacentric were common in all karyotype formulae of all different achene morphs of *Picris asplenoides* and *Urospermum picroides*. Not only the dissimilarity was found in the morphology of chromosomes but also in the Mean Chromosome Length (MCL) and Diploid Chromosome Length (DCL). Types and proportions of abnormalities for different achene morphs of *Picris asplenoides* and *Urospermum picroides* observed at mitotic division were analysed. The electrophoretic analysis of *Picris asplenoides* revealed the presence of fourteen bands of molecular weight ranging from 145.00 to 20.00 kD. The band with molecular weight 20.00 kD was restricted to brown achene form and can be used as molecular marker to distinguish brown achene form from violet achene form. The electrophoretic analysis of *Urospermum picroides* reveals the presence of nine bands of molecular weight ranging from 95.00 to 22.00 kD. The band with molecular weight 22.25 kD was restricted to white achene form and can be used as molecular marker to distinguish white achene form other achene forms. The nuclear DNA content for *Picris asplenoides* were 0.0295 and 0.0183 microg g(-1) fresh weight

for violet and brown achene, respectively, while RNA content were 25.347 and 35.069 microg g(-1) fresh weight for violet and brown achene, respectively. The nuclear DNA content for *Urospermum picroides* were 0.093, 0.115 and 0.145 microg g(-1) fresh weight for brown, black and white achene, respectively while RNA content were 10.417, 17.361 and 21.528 microg g(-1) fresh weight for black, white and brown achene, respectively.

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