

Quick Search

[Search History](#)[Results list](#)[Previous](#)

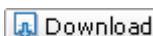
31 of 57

[Next](#)[Current Science](#)








Volume 93, Issue 1, 10 July 2007, Pages 67-72

[Basic Format](#)[Extended Format](#)

Document Type: Article

[View references](#) (31)[View at Publisher](#)

Assessing genetic diversity of *Tecomella undulata* (Sm.) - An endangered tree species using amplified fragment length polymorphisms-based molecular markers

[Bhau, B.S.^a](#)  , [Negi, M.S.^b](#) , [Jindal, S.K.^c](#) , [Singh, M.^c](#) , [Lakshmikumar, M.^b](#)  ^a Plant Genomics **Laboratory**, Medicinal, Aromatic and Economic Plants Division, **North-East Institute of Science and Technology - Jorhat, Jorhat** 785 006, India^b Bioresource and Biotechnology Division, Energy Resources **Institute**, Habitat Place, Lodhi Road, New Delhi 110 003, India^c Central Arid Zone **Research Institute**, Jodhpur 342 003, India

Abstract

Tecomella undulata is an important agro-forestry tree in the western parts of India, which has been included in the list of endangered plant species due to over exploitation. There is an urgent need to formulate appropriate conservation and breeding strategies to save this versatile tree. Quantification of genetic diversity in the existing populations of *T. undulata* prevalent in India, is an essential first step towards this objective. The present work was undertaken to investigate the utility of amplified fragment length polymorphism (AFLP) markers in the assessment of genetic diversity and phenetic relationship among 42 *T. undulata* plants collected from different regions of India. Eight AFLP primer combinations generated a total of 338 bands across the 42 *T. undulata* accessions screened. On an average, 42 AFLP fragments were amplified per reaction. Of the total 338 AFLP fragments, 71.7% was polymorphic across all the accessions. From the AFLP data, a similarity matrix based on Jaccard's coefficient was calculated which was used for constructing a phenetic dendrogram using UPGMA analysis. *T. undulata* accessions represented high levels of genetic variation as indicated by GS values ranging from 0.721 to 0.83, at which 42 *T. undulata* accessions grouped together. The pattern of grouping in the phenogram was highly consistent as indicated by high values of co-phenetic correlation ($r = 0.87$, $P = 1$) as also by high bootstrap values at the key nodes. Principal correspondence analysis also

Cited By since 1996




This article has been cited **0** times in Scopus.

Inform me when this document is cited in Scopus:

- [E-mail Alert](#)
-  [RSS](#)

Find related documents

In Scopus based on

-  [references](#)
-  [authors](#)
-  [keywords](#)

On the Web based on


- [title](#)
-  [authors](#)
-  [keywords](#)

revealed that *T. undulata* accessions were scattered on the plot. Based on our study, it may be concluded that there is a high level of genetic diversity in *T. undulata* accessions analysed, which may be attributed to its out-crossing nature. Our study may be useful in identifying diverse genetic stocks of *T. undulata*, which may then be conserved on priority basis.

Author Keywords

AFLP; Conservation; Genetic diversity; Molecular markers; *Tecomella undulata*

References (31) [view in table layout](#)

↙  Output Select: Page

1. (1982) *The Wealth of India*, 10, pp. 134-136.
Publications and Information Directorate, CSIR, New Delhi, Anon
2. Jindal, S.K., Kackar, N.L., Solanki, K.R.
Evaluation of *Tecomella undulata* (Sm.) SEEM germplasm from western Rajasthan in situ
(1985) *Trans. Indian Soc. Desert Technol. Univ. Cent. Desert Stud*, 10, pp. 33-37.
3. Jindal, S.K., Solanki, K.R., Kackar, N.L.
Phenology and breeding systems of Rohida (*Tecomella undulata* (Sm.) SEEM)
(1985) *Indian J. For*, 8, pp. 317-320.
4. Jindal, S.K., Kackar, N.L., Solanki, K.R.
Germplasm collection and genetic variability in Rohida (*Tecomella undulata* (Sm.) Seem) in western Rajasthan
(1987) *Indian J. For*, 10, pp. 52-55.
5. Rao, A., Kiran-Bala, V., Lahiri, A.N., Bala, K.
Influence of trees on microorganisms of aridisol and its fertility
(1989) *Indian For*, 115, pp. 680-683.
6. Azam, M.M.
Anti-HIV agents and other compounds from *Tecomella undulata*
(1999) *Orient. J. Chem*, 15, pp. 375-377. [Cited 2 times.](#)
7. Dushyent, G., Bohra, A.
Toxic effects of various plant part extracts on the causal organism of typhoid fever
(2000) *Curr. Sci*, 78, pp. 780-781. [Cited 4 times.](#)
8. Ahmad, F., Alam Khan, R., Rasheed, S.
Preliminary screening of methanolic extracts of *Celastrus paniculatus* and *Tecomella undulata* for analgesic and antiinflammatory activities
(1994) *Journal of Ethnopharmacology*, 42 (3), pp. 193-198. [Cited 12 times.](#)
doi: 10.1016/0378-8741(94)90085-X
[Abstract + Refs](#) [View at Publisher](#)
9. Jain, S.K., Rao, R.R.
An assessment of threatened plants of India
(1983) *Botanical Survey of India, Howrah*, p. 334.

10. Jindal, S.K., Singh, M., Solanki, K.R., Kackar, N.L.
Changes in genetic parameters and ranks of tree height over six growth years in *Tecomella undulata* (Sm.) Seem
(1992) *Silvae Genet*, 41, pp. 213-216. [Cited 3 times](#).
11. Cruzan, M.B.
Genetic markers in plant evolutionary ecology
(1998) *Ecology*, 79 (2), pp. 400-412. [Cited 50 times](#).
[Abstract + Refs](#) [View at Publisher](#)
12. Berg, E.E., Hamrick, J.L.
Fine-scale genetic structure of a Turkey oak forest
(1995) *Evolution*, 49 (1), pp. 110-120. [Cited 84 times](#).
[Abstract + Refs](#) [View at Publisher](#)
13. Powell, W., Morgante, M., Andre, C., Hanafey, M., Vogel, J., Tingey, S., Rafalski, A.
The comparison of RFLP, RAPD, AFLP and SSR (microsatellite) markers for germplasm analysis
(1996) *Molecular Breeding*, 2 (3), pp. 225-238. [Cited 600 times](#).
[Abstract + Refs](#) [View at Publisher](#)
14. Mueller, U.G., Wolfenbarger, L.L.
AFLP genotyping and fingerprinting
(1999) *Trends in Ecology and Evolution*, 14 (10), pp. 389-394. [Cited 278 times](#).
doi: 10.1016/S0169-5347(99)01659-6
[Abstract + Refs](#) [View at Publisher](#)
15. Jones, C.J., Edwards, K.J., Castaglione, S., Winfield, M.O., Sala, F., Van De Wiel, C., Bredemeijer, G., (...), Karp, A.
Reproducibility testing of RAPD, AFLP and SSR markers in plants by a network of European laboratories
(1997) *Molecular Breeding*, 3 (5), pp. 381-390. [Cited 319 times](#).
[Abstract + Refs](#) [View at Publisher](#)
16. Doyle, J.J., Doyle, J.L.
Isolation of plants DNA from fresh tissue
(1990) *Focus*, 12, pp. 13-15. [Cited 2210 times](#).
17. Zabeau, M. and Vos, P, Selective restriction fragment amplification: A general method for DNA fingerprinting. European Patent Application of 92402629, 1993 Publ. no. 0534858A1
18. Negi, M.S., Singh, A., Lakshmikumaran, M.
Genetic variation and relationship among and within *Withania* species as revealed by AFLP markers
(2000) *Genome*, 43 (6), pp. 975-980. [Cited 11 times](#).
doi: 10.1139/gen-43-6-975
[Abstract + Refs](#) [View at Publisher](#)
19. Jaccard, P.
Nouvelles recherches sur la distribution florale
(1908) *Bull. Soc. Sci. Nat*, 44, pp. 223-270. [Cited 868 times](#).
20. Sneath, P.H.A., Sokal, R.R.
Numerical taxonomy
(1973) *Numerical Taxonomy*. [Cited 2 times](#).
W.H. Freeman, San Francisco, California
[View on Web](#)
21. Rohlf, H. J, NTSYS-pc: Numerical taxonomy and multivariate

analysis system, version 2.02, Exeter Publications, New York, 1994

22. Felsenstein, J.
Confidence limits on phylogenies: An approach using the bootstrap
 (1985) *Evolution*, 39, pp. 783-791. [Cited 10802 times.](#)
[View at Publisher](#)
23. Yap, I.V., Nelson, R.J.
 (1996) *WINBOOT: A program for performing bootstrap analysis of binary data to determine confidence limits of UPGMA-based dendrograms.* [Cited 183 times.](#)
 International Rice Research Institute, Manila, Philippines, 1st edn
24. Mantel, N.
The detection of disease clustering and a generalized regression approach.
 (1967) *Cancer Research*, 27 (2), pp. 209-220. [Cited 2524 times.](#)
[Abstract + Refs](#)
25. Sanchez, G., Restrepo, S., Duque, M.-C., Fregene, M., Bonierbale, M., Verdier, V.
AFLP assessment of genetic variability in cassava accessions (*Manihot esculenta*) resistant and susceptible to the cassava bacterial blight (CBB)
 (1999) *Genome*, 42 (2), pp. 163-172. [Cited 21 times.](#)
[Abstract + Refs](#) [View at Publisher](#)
26. Monte-Corvo, L., Cabrita, L., Oliveira, C., Leitão, J.
Assessment of genetic relationships among *Pyrus* species and cultivars using AFLP and RAPD markers
 (2000) *Genetic Resources and Crop Evolution*, 47 (3), pp. 257-265. [Cited 21 times.](#)
 doi: 10.1023/A:1008794809807
[Abstract + Refs](#) [View at Publisher](#)
27. Seefeldter, S., Ehrmaier, H., Schweizer, G., Seigner, E.
Genetic diversity and phylogenetic relationships among accessions of hop, *Humulus lupulus*, as determined by amplified fragment length polymorphism fingerprinting compared with pedigree data
 (2000) *Plant Breeding*, 119 (3), pp. 257-263. [Cited 21 times.](#)
 doi: 10.1046/j.1439-0523.2000.00500.x
[Abstract + Refs](#) [View at Publisher](#)
28. Miller, J.C., Tanksley, S.D.
RFLP analysis of phylogenetic relationships and genetic variation in the genus *Lycopersicon*
 (1990) *Theoretical and Applied Genetics*, 80 (4), pp. 437-448. [Cited 183 times.](#)
 doi: 10.1007/BF00226743
[Abstract + Refs](#) [View at Publisher](#)
29. Paul, S., Wachira, F. N., Powell, W. and Waugh, R., Diversity and genetic differentiation among populations of Indian and Kenyan tea (*Camellia sinensis* L. O. Kuntze) revealed by AFLP markers. *Theor. Appl. Genet.*, 1997, 94, 255-263.
30. Singh, A., Chaudhury, A., Srivastava, P.S., Lakshmikumaran, M.
Comparison of AFLP and SAMPL markers for assessment of intra-population genetic variation in *Azadirachta indica* A.

Juss.

(2002) *Plant Science*, 162 (1), pp. 17-25. [Cited 16 times](#).

doi: 10.1016/S0168-9452(01)00503-9

[Abstract + Refs](#)