

Volume 8 Issue 2 August 2010

# PLANT GENETIC RESOURCES

CHARACTERIZATION  
AND UTILIZATION



CAMBRIDGE  
UNIVERSITY PRESS

ISSN 1479-2621



# Plant Genetic Resources: Characterization and Utilization

Volume 8 2010 ISSN: 1479-2621

## Aims and Scope

The journal provides a forum for describing the application of novel genomic technologies, as well as their integration with established techniques, towards the understanding of the genetic variation captured in both *in situ* and *ex situ* collections of crop and non-crop plants; and for the airing of wider issues relevant to plant germplasm conservation and utilisation. We particularly welcome multi-disciplinary approaches that incorporate both a technical and a socio-economic focus.

Technical aspects can cover developments in technologies of potential or demonstrated relevance to the analysis of variation and diversity at the phenotypic and genotypic levels; the development of rational germplasm collection, evaluation and conservation strategies; and the impact of crop genetic modification and biotechnology on plant genetic resources. Authors should note that the journal will not review submissions using the RAPD marker system, except where very large numbers of assays place a cost limitation on the analysis, or where RAPD data is combined with, and is co-analysed with other forms of descriptive data, which allows an objective means of assessing the credibility of the RAPDs.

Non-technical aspects can include ethical, legal, commercial and social issues of relevance, in particular relating to farmers' rights, intellectual property and ethnobotany.

## Editor-in-Chief

Robert Koebner  
CropGen International, UK  
plantgeneticresources@googlemail.com

## Editorial Board

- |  |   |
|--|---|
| M. T. Abberton, <i>Institute of Grassland and Environmental Research, UK</i> | J. Jia, <i>Chinese Academy of Agricultural Sciences, China</i>                              |
| A. Beharav, <i>University of Haifa, Israel</i>                               | U. C. Lavania, <i>Central Institute of Medicinal &amp; Aromatic Plants, India</i>           |
| D. Bertoli, <i>University of Brasilia, Brazil</i>                            | R. J. Smith, <i>Royal Botanic Gardens Kew, UK</i>   |
| H. Bockelman, <i>National Small Grains Collection, USA</i>                   | S. Smith, <i>Pioneer Hi-Bred International Inc, USA</i>                                     |
| C. Fatokun, <i>International Institute of Tropical Agriculture, Nigeria</i>  | R. Tuberosa, <i>University of Bologna, Italy</i>  |
| B. Ford-Lloyd, <i>University of Birmingham, UK</i>                           | R. Varshney, <i>International Crops Research Institute for the Semi-Arid Tropics, India</i> |
| D. Jarvis, <i>International Plant Genetic Resources Institute, Italy</i>     |   |

Cover image: Whole plant of *Chlorophytum borivillianum* showing medicinally/nutraceutically important fascicular roots. (Photo by U. C. Lavania.)

2010 Cambridge University Press. All rights reserved  
Published by Cambridge University Press (a division of Cambridge University Press),  
Cambridge CB2 8RU; New York, NY 10013-2473

# Plant Genetic Resources Characterization and Utilization

## Contents

Marker-assisted reduction of redundancy in a genebank collection of cultivated lettuce <i>R. van Treuren, E. C. de Groot, I. W. Boukema, C. C. M. van de Wiel and Th. J. L. van Hintum</i> . . . . .	95
The relic Criollo cacao in Belize – genetic diversity and relationship with Trinitario and other cacao clones held in the International Cocoa Genebank, Trinidad <i>Lambert A. Motilal, Dapeng Zhang, Pathmanathan Umabaran, Sue Mischke, Vishnarayan Mooleedhar and Lyndel W. Meinhardt</i> . . . . .	106
Impact of farmers' practices and seed systems on the genetic structure of common sorghum varieties in Kenya and Sudan <i>Ismail Y. Rabbi, Hartwig H. Geiger, Bettina I. G. Hausmann, Dan Kiambi, Rolf Folkertsma and Heiko K. Parzies</i> . . . . .	116
Short Communication	
Hybridization for increased yield and nutritional content of snake melon ( <i>Cucumis melo</i> L. var. <i>flexuosus</i> ) <i>Sudhakar Pandey, N. P. S. Dhillon, A. K. Sureja, Dilbag Singh and Ajaz A. Malik</i> . . . . .	127
Identification of <i>Aegilops</i> species with higher production of phytosiderophore and iron and zinc uptake under micronutrient-sufficient and -deficient conditions <i>Kumari Neelam, Vijay K. Tiwari, Nidhi Rawat, Sangbarsb K. Tripathi, Gursbarn S. Randbawa and Harcharan S. Dbaliwal</i> . . . . .	132
Assessment of the genetic diversity in cowpea ( <i>Vigna unguiculata</i> L. Walp.) germplasm from Ghana using simple sequence repeat markers <i>Aaron T. Asare, Bhavani S. Gowda, Isaac K. A. Galyuon, Lawrence L. Aboagye, Jemmy F. Takrama and Michael P. Timko</i> . . . . .	142
Diversity among different populations of a locally common rice ( <i>Oryza sativa</i> L.) landrace from north-western Indian Himalayas <i>S. Kumar, A. Pandey, I. S. Bisht, K. V. Bhat and P. S. Mehta</i> . . . . .	151
Short Communication	
Five fruit morphotypes of Russian olive ( <i>Elaeagnus angustifolia</i> L.) from Ladakh, India <i>Anup Raj, Mohammad Mehdi, Om Chand Sharma and Punam K. Sharma</i> . . . . .	159
Identification and evaluation of vegetable type pigeonpea ( <i>Cajanus cajan</i> (L.) Millsp.) in the world germplasm collection at ICRISAT genebank <i>H. D. Upadhyaya, K. N. Reddy, C. L. L. Gowda and Sube Singh</i> . . . . .	162
Distribution of genetic diversity in wild European populations of prickly lettuce ( <i>Lactuca serriola</i> ): implications for plant genetic resources management <i>C. C. M. van de Wiel, T. Sretenović Rajičić, R. van Treuren, K. J. Debmer, C. G. van der Linden and Th. J. L. van Hintum</i> . . . . .	171
Current taxonomic composition of European genebank material documented in EURISCO <i>Theo van Hintum and Helmut Knüpfper</i> . . . . .	182
Book Review . . . . .	189

# Plant Genetic Resources Characterization and Utilization

[journals.cambridge.org/pgr](http://journals.cambridge.org/pgr)

## **Publishing, Production, Marketing and Subscription Sales Office:**

Cambridge University Press  
The Edinburgh Building  
Shaftesbury Road  
Cambridge CB2 8RU  
UK

## **For Customers in North America:**

Cambridge University Press  
Journals Fulfillment Dept  
100 Brook Hill Drive  
West Nyack 10994-2133  
USA

**Publisher:** Katy Christomanou

*Plant Genetic Resources: Characterization and Utilization* is an international journal published tri-annually by Cambridge University Press in April, August and December on behalf of NIAB. The online edition is available at [journals.cambridge.org/pgr](http://journals.cambridge.org/pgr).

## **Special sales and supplements:**

This Journal accepts advertising and inserts. We also provide bulk reprints of suitable papers to meet teaching or promotional requirements. The Journal also publishes proceedings on behalf of academic and corporate sponsors. Please contact Katy Christomanou at the Cambridge address above.

## **Subscription information:**

The subscription rates for Volume 8, 2010 (3 issues) are:

Institutional subscription

Internet/Print Package £300.00/\$576.00 (Americas only)

Internet only £240.00/\$463.00 (Americas only)

Print only £278.00/\$535.00 (Americas only)

Any **supplements** to this Journal published in the course of the annual volume are normally supplied to subscribers at no extra charge.

**Back volumes** are available. Please contact CUP Publishing for further information.

**Claims** for non-receipt of journal issues will be considered on their merit and only if the claim is received within six months of

publication. Replacement copies supplied after this date will be chargeable.

**US POSTMASTERS:** please send address corrections Plant Genetic Resources USA address.

## **Information for Authors:**

Please email manuscript (with any accompanying figures or tables) to the Journal Administrator Faye Kalloniatis at [plantgeneticresources@googlemail.com](mailto:plantgeneticresources@googlemail.com)

**Notes for Authors** are available on the internet at [journals.cambridge.org/pgr](http://journals.cambridge.org/pgr)

**Offprints:** The corresponding author of an accepted paper will receive a pdf offprint. Additional offprints are available for a fee and should be ordered at proof stage. **No page charges or submission charges are levied by this journal.**

**Copyright:© NIAB 2010.** All rights reserved: permission for reproduction of any part of the journal (text, figures, tables or other matter) in any form (on paper, microfiche or electronically) should be sought directly from CUP or a licence permitting restricted copying obtained from the Copyright Licensing Agency, Tottenham Court Road, London W1P 9HE, UK, or in the USA from the Central Clearance Center, 27 Congress Street, Salem MA 01970.

**Disclaimer:** The information contained herein, including any expression of opinion and any projection or forecast, has been obtained from or is based upon sources believed by us to be reliable, but is not guaranteed as to accuracy or completeness. The information is supplied without obligation and on the understanding that any person who acts upon it or otherwise changes his/her position in reliance thereon does so entirely at his/her own risk.

CUP uk\_journals\_customerservice does not accept responsibility for any trade advertisement included in this publication.

Printed by Latimer Trend, Plymouth, UK.

This journal issue has been printed on FSC-certified paper and cover board. FSC is an independent, non-governmental, not-for-profit organization established to promote the responsible management of the world's forests. Please see [www.fsc.org](http://www.fsc.org) for information.