SUBSCRIPTIONS

A subscription to Annals of Botany comprises 12 issues and 2 special issues. Prices include dispatch by Standard Air. Airmail rates are available on request. Annals of Botany Advance Access contains papers that have recently been accepted but have not yet been included within an issue. Advance Access is updated daily.

Annual Subscription Rate (Volumes 121 and 122, 14 issues, 2018)

**Corporate**
Print and online access £1478/$2956/€2218
Print edition only £1362/$2724/€2044
Site-wide online access only £1087/$2175/€1632

**Institutional**
Print and online access £1182/$2293/€1774
Print edition only £1090/$2119/€1635
Site-wide online access only £857/$1662/€1292

Please note: UK£ rate applies to UK and Rest of World, except US and Canada (US$) and Europe (Eur€). There are other subscription rates available; for a complete listing, please visit www.aob.oxfordjournals.org/subscriptions.

Full prepayment in the correct currency is required for all orders. Payment should be in US dollars for orders being delivered to the USA or Canada; Euros for orders being delivered within Europe (excluding the UK); GBP Sterling for orders being delivered elsewhere (i.e., not being delivered to USA, Canada, or Europe). All orders should be accompanied by full payment and sent to your nearest Oxford Journals office. Subscriptions are accepted for complete volumes only. Orders are regarded as firm, and payments are not refundable. Our prices include dispatch by Standard Air. Claims must be notified within four months of despatch/order date (whichever is later). Subscriptions in the EEC may be subject to European VAT. If registered, please supply details to avoid unnecessary charges. For subscriptions that include online versions, a proportion of the subscription price may be subject to UK VAT. Subscribers in Canada, please add GST to the prices quoted. Personal rate subscriptions are only available if payment is made by personal cheque or credit card, delivery is to a private address, and is for personal use only.

The current year and two previous years’ issues are available from Oxford Journals. Previous volumes can be obtained from the Periodicals Service Company at http://www.periodicals.com/oxford.html or Periodicals Service Company, 11 Main Street, Germantown, NY 12526, USA. E-mail: psc@periodicals.com. Tel: (518) 537-4700. Fax: (518) 537-5899.

**Contact information**

Journals Customer Service Department, Oxford Journals, Great Clarendon Street, Oxford OX2 6DP, UK. E-mail: jnls.cust.serv@oup.com. Tel: +44 (0)1865 353907. Fax: +44 (0)1865 353485. In the Americas, please contact: Journals Customer Service Department, Oxford Journals, 2001 Evans Road, Cary, NC 27513, USA. E-mail: jnlorders@oup.com. Tel: (800) 852-7323 (toll-free in USA/Canada) or (919) 677-0977. Fax: (919) 677-1714. In Japan, please contact: Journals Customer Service Department, Oxford Journals, 4-5-10-8F Shiba, Minato-ku, Tokyo, 108-8386, Japan. E-mail: custserv.jp@oup.com. Tel: (81) 3 5444 5858. Fax: (81) 3 3454 2929.

**Methods of payment**

Payment should be made: by cheque (to Oxford Journals, Cashiers Office, Great Clarendon Street, Oxford, OX2 6DP, UK); by bank transfer [to Barclays Bank Plc, Oxford Office, Oxford (bank sort code 20-65-18) (UK); overseas only Swift code BARC GB22 (GB Sterling Account no. 70299332, IBAN GB89BARC20651870299332; US$ Dollars Account no. 66014600, IBAN GB27BARC20651866014600; EUE EURO Account no. 78923655, IBAN GB16BARC20651878923655]; or by credit card (Mastercard, Visa, Switch or American Express).

**Postal information**

Annals of Botany (ISSN: 0305-7364) is published monthly by Oxford University Press, UK. Annals of Botany is distributed in the USA by Mercury Media Processing LLC, 1850 Elizabeth Ave., Suite #C, Rahway, NJ 07065, USA. Periodicals Postage Paid at Rahway, NJ and at additional entry points. US POSTMASTER: Send address changes to Annals of Botany, c/o Mercury Media Processing, 1634 E. Elizabeth Ave., Linden, NJ 07036, USA.

**Environmental and ethical policies**

Oxford Journals, a division of Oxford University Press, is committed to working with the global community to bring the highest quality research to the widest possible audience. Oxford Journals will protect the environment by implementing environmentally friendly policies and practices wherever possible. Please see http://www.oxfordjournals.org/ethicalpolicies.html for further information on environmental and ethical policies.

**Digital object identifiers**

For information on dois and to resolve them, please visit www.doi.org.

**Permissions**

For information on how to request permissions to reproduce articles or information from this journal, please visit www.oxfordjournals.org/permissions.

**Advertising**

Advertising, inserts and artwork enquiries should be addressed to Advertising and Special Sales, Oxford Journals, Oxford University Press, Great Clarendon Street, Oxford, OX2 6DP, UK. Tel: +44 (0)1865 354767; Fax: +44 (0)1865 353774; E-mail: jnlsadvertising@oup.com.

Copyright © 2018 The Annals of Botany Company.
TECHNICAL ARTICLE
Bastien Lecigne, Sylvain Delagrange and Christian Messier  
Exploring trees in three dimensions: VoxR, a novel voxel-based R package dedicated to analysing the complex arrangement of tree crowns  
589

REVIEW
Awais Rashid, Abdul Mujjib-Kazi, Francis Chucks Oghomaya, Zhonghu He and Sanjaya Rajaram  
Wheat genetic resources in the post-genomics era: promise and challenges  
603

ORIGINAL ARTICLES
Ping Ren, Sergio Rossi, J. Julio Camarero, Aaron M. Ellison, Eryuan Liang and Josep Penuelas  
Critical temperature and precipitation thresholds for the onset of xylogenesis of Juniperus przewalski in a semi-arid area of the north-eastern Tibetan Plateau  
617

Alessandro Alves-Pereira, Charles R. Clement, Duriane Pina-Carneiro-Rodrigues, Elisabeth A. Wavry, Gabriel Desguigiovanni, Santiago L. F. Ramos, José Bilheiro and Maria L. Zacchi  
Patterns of nuclear and chloroplast genetic diversity and structure of manioc along major Brazilian Amazonian rivers  
625

Bo Song, Bing Stöcklin, W. Scott Armbruster, Yongqian Gao, Dei Peng and Hang Sun  
Reversible colour change in leaves enhances pollinator attraction and reproductive success in Saururus chinensis  
641

Ko Mochizuki and Atsushi Kawakita  
Pollination by fungus gnats and associated floral characteristics in five families of the Japanese flora*  
651

Leiyang Fan, Hongqi Zheng, Richard I. Miller, Lei Zheng and Kangshan Mao  
Strong population bottleneck and repeated demographic expansions of Populus adenopoda (Salicaceae) in subtropical China  
665

Anne-Laure Decombeix, Rudolph Serbet and Edith L. Taylor  
Under pressure? Epicormic shoots and traumatic growth zones in high-latitude frasian trees from East Antarctica  
681

Brin J. Zerman and John W. Morgan  
Increasing and declining native species in urban remnant grasslands respond differently to nitrogen addition and disturbance  
691

Dennis Komuneur, Guillermo Toro, Ole Pedersen and Timothy David Calmer  
Waterlogging tolerance, tissue nitrogen and oxygen transport in the forage legume Melilotus indicus: a comparison of nodulated and nitrate-fed plants  
699

*These are the editor’s choice articles and are available free on-line
Elodie Chapurlat, Joseph Anderson, Jon Ågren, Magne Friberg and Nina Sletvold  *Diel pattern of floral scent emission matches the relative importance of diurnal and nocturnal pollinators in populations of Gymnadenia conopsea* 711

Hirokazu Takahashi, Xiaohua Qi, Satoshi Shimamura, Asako Yanagawa, Susumu Hiraga and Mikio Nakazato  *Sucrose supply from leaves is required for aerenchymatous phellem formation in hypocotyl under waterlogged conditions* 723

Béatrice Albert, Adineere Reisaye, Christelle Dillmann, Ann L. Carlson, Robert J. Swanson, Pierre-Heidi Gouyon and Anna A. Dobrus  *Effect of aperture number on pollen germination, survival and reproductive success in Arabidopsis thaliana* 733

Adeel Mustafa, Hans-Jürgen Ensikat and Maximilian Weigend  *Mineralized trichomes in Boraginales: complex microscale heterogeneity and simple phylogenetic patterns* 741

Simon K. Emms, Alisa A. Hove, Leah S. Dudley, Susan J. Mazer and Amy S. Verhoeven  *Could seasonally deteriorating environments favour the evolution of autogamous selfing and a drought escape physiology through indirect selection? A test of the time limitation hypothesis using artificial selection in Clarkia* 753

The Annals of Botany accepts high quality papers from throughout the world, makes NO PAGE CHARGES, supplies free of charge a URL giving access to the PDF file and makes NO CHARGE FOR COLOUR PLATES. An exclusive licence in all papers accepted for publication must be assigned to the Annals of Botany Company, but the Company will not put any limitation on the personal freedom of the author to use material contained in the paper in other works of which he or she is the author.

Preparing and submitting manuscripts to the Annals of Botany

A guide to submitting manuscripts to the Journal can be accessed from the Journal’s home page (https://academic.oup.com/aob). Please note that submission should normally be in electronic form.

Contact details are: Annals of Botany Editorial Office, Department of Plant Sciences, University of Oxford, South Parks Road, Oxford OX1 3RB, UK.

E-mail: office@annbot.com for editorial questions and annbot.editorialoffice@oup.com for questions about the electronic author submission and refereeing system; Tel: +44 (0)1865 275121.

Annals of Botany Company 2018

All rights reserved; no part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise without prior written permission of the Publishers, or a licence permitting restricted copying issued in the UK by the Copyright Licensing Agency Ltd, 90 Tottenham Court Road, London W1P 9HE, or in the USA by the Copyright Clearance Center, Inc, 222 Rosewood Drive, Danvers, MA 01923. Articles can be obtained by fax in 48 hours by calling: WISE for Medicine ™ 1-800-667-WISE.