

Phytochemistry Vol. 67, No. 16, 2006

Special issue

Rod Croteau (Part 2)

Editor: Norman G. Lewis

Contents

Editorial

pp 1704–1705

Editorial

pp 1706–1707

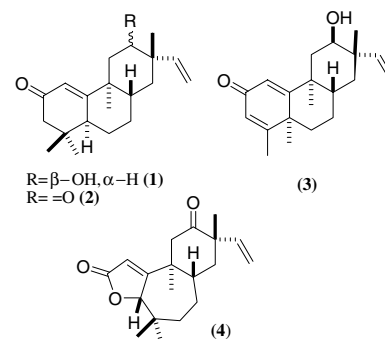
METABOLISM

Structures, biogenetic relationships, and cytotoxicity of pimarane-derived diterpenes from *Petalostigma pubescens*

pp 1708–1715

Mary H. Grace, Yinghua Jin, George R. Wilson, Robert M. Coates\*

Four diterpenes, 5,9-syn-rosanes petalostigmones A and B (**1** and **2**), the erythroxylane petalostigmonone C (**3**), and the norditerpene lactone pubescenone (**4**), together with the known *ent*-cleistanthane diterpene (–)-sonderianol, were isolated from *Petalostigma pubescens*. Biogenetic schemes are presented to rationalize the structures of these natural products.

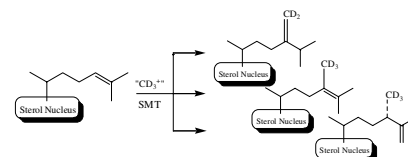


Phytosterol biosynthesis pathway in *Mortierella alpina*

pp 1716–1721

W. David Nes\*, Shawn D. Nichols

The construction of three 24-methyl sterol side chains by the action of a common sterol methyltransferase was suggested by chemical identification studies and incubation of *Mortierella alpina* mycelium with methionine-methyl-<sup>2</sup>H<sub>3</sub>.

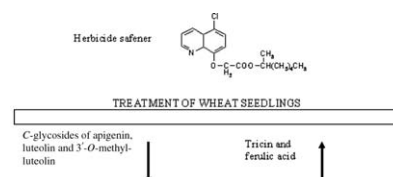


Selective disruption of wheat secondary metabolism by herbicide safeners

pp 1722–1730

Ian Cummins, Melissa Brazier-Hicks, Maciej Stobiecki, Rafa Frański, Robert Edwards\*

Treatment of wheat seedlings with the herbicide safener cloquintocet mexyl causes a selective loss of flavone C-glycosides of luteolin ≫ apigenin = 3'-O-methyl-luteolin and an accumulation of the methylated flavone triclin and ferulic acid.

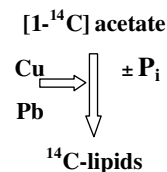


## Lead and copper effects on lipid metabolism in cultured lichen photobionts with different phosphorus status

pp 1731–1739

Irina A. Guschina, John L. Harwood \*

Algal photobionts (*Coccomyxa*, *Trebouxia* spp.) from lichens were challenged with environmentally relevant concentrations of copper or lead and effects on their lipid metabolism assessed.

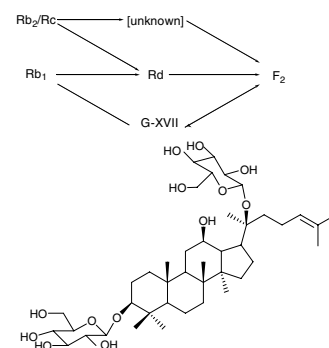


## In vitro metabolism of ginsenosides by the ginseng root pathogen *Pythium irregulare*

pp 1740–1749

Lina F. Yousef, Mark A. Bernards \*

Cultures of the ginseng root pathogen *Pythium irregulare* selectively metabolize 20(*S*)-protopanaxadiol ginsenosides (e.g., Rb<sub>1</sub>, Rb<sub>2</sub>, Rc and Rd) into a single compound, ginsenoside F<sub>2</sub>, via an extracellular glycosidase(s).



## Metabolite profiling of carotenoid and phenolic pathways in mutant and transgenic lines of tomato: Identification of a high antioxidant fruit line

pp 1750–1757

Marianne Long, David J. Millar, Yukiko Kimura, Georgina Donovan, Jon Rees, Paul D. Fraser, Peter M. Bramley\*, G. Paul Bolwell

Mutant and transgenic tomato fruit have been profiled for carotenoids and phenolics to identify high antioxidant lines.

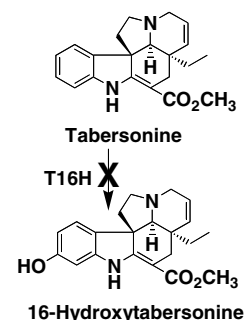


## Identification of a low vindoline accumulating cultivar of *Catharanthus roseus* (L.) G. Don by alkaloid and enzymatic profiling

pp 1758–1764

Mary Magnotta, Jun Murata, Jianxin Chen, Vincenzo De Luca \*

A single *Catharanthus roseus* flower cultivar altered in vindoline accumulation was successfully identified by metabolic profiling. This cultivar had a 10-fold lower tabersonine-16-hydroxylase activity than lines accumulating normal levels of vindoline.



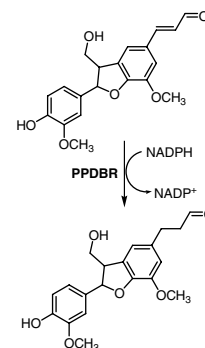
## MOLECULAR GENETICS AND GENOMICS

***Pinus taeda* phenylpropenal double-bond reductase: Purification, cDNA cloning, heterologous expression in *Escherichia coli*, and subcellular localization in *P. taeda***

pp 1765–1780

Hiroyuki Kasahara, Ying Jiao, Diana L. Bedgar, Sung-Jin Kim, Ann M. Patten, Zhi-Qiang Xia, Laurence B. Davin, Norman G. Lewis\*

A phenylpropenal double-bond reductase (PPDBR) was obtained from cell suspension cultures of loblolly pine (*Pinus taeda* L.). Its cDNA was subsequently cloned, with the functional recombinant protein expressed in *Escherichia coli* and characterized. PPDBR readily converted both dehydrodiconiferyl and coniferyl aldehydes into dihydrodehydrodiconiferyl and dihydroconiferyl aldehydes, when NADPH was added as cofactor.



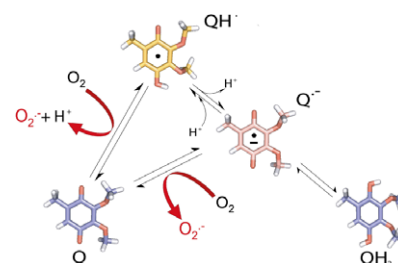
## CHEMISTRY

**Computation of the redox and protonation properties of quinones: Towards the prediction of redox cycling natural products**

pp 1781–1788

Jonathan L. Cape, Michael K. Bowman, David M. Kramer\*

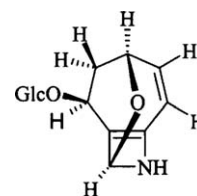
This work reports the use of a calibrated computational approach to provide reasonable estimates of semiquinone stability in quinone natural products and related compounds as a first approximation of redox cycling ability.

**An unusual glucoside from *Cleistanthus gracilis***

pp 1789–1792

Paulo M. Pinho, Waree Naengchomnong, Anake Kijjoa, Nair Nazareth, Artur M.S. Silva, Graham Eaton, Werner Herz\*

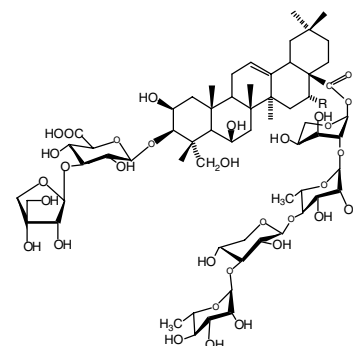
Roots and stems of *Cleistanthus gracilis* furnished a glucoside gracicleistanthoside, the glucoside of 2-hydroxy-8-azabicyclo-(5,2,0)-4,9-epoxynona-5,7-diene.

**Saponins from the seeds of *Mimusops laurifolia***

pp 1793–1799

Jacqueline Eskander, Catherine Lavaud\*, Isabelle Pouny, Hesham S.M. Soliman, S.M. Abdel-Khalik, I.I. Mahmoud

Three bidesmosidic 16 $\alpha$ -hydroxyprotobassic acid saponins were isolated from the seeds of *Mimusops laurifolia* along with six known saponins, butyroside C, arganine D, Mi-saponin A, tieghemelin A, arganine A and arganine C. The structures were established by spectroscopic methods.



## ECOLOGICAL BIOCHEMISTRY

### Nep1-like proteins from plant pathogens: Recruitment and diversification of the NPP1 domain across taxa

pp 1800–1807

Mark Gijzen<sup>\*</sup>, Thorsten Nürnberger

A review of the literature and current state of knowledge of the Nep1-like proteins from plant pathogens and saprophytes. The proteins are distinguished by their ability to rapidly activate defense response and cause cell death in dicotyledonous plants.

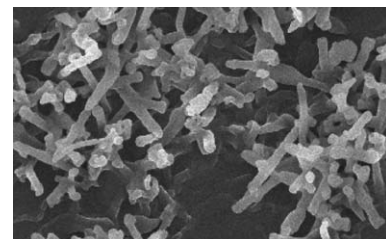


### Nanotubules on plant surfaces: Chemical composition of epicuticular wax crystals on needles of *Taxus baccata* L.

pp 1808–1817

Miao Wen, Christopher Buschhaus, Reinhard Jetter<sup>\*</sup>

Various sampling protocols were employed to study the chemical composition of yew needle waxes with high spatial resolution. GC–MS analyses of the resulting preparations provided direct evidence that the tubular wax crystals on the needle surfaces contained high percentages of alkanediols and nonacosan-10-ol on the abaxial and adaxial surfaces of the needles, respectively.

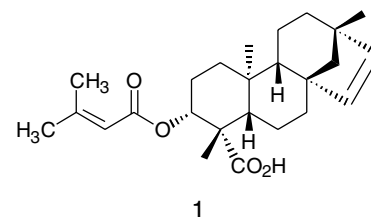


### Insect-antifeedant and antibacterial activity of diterpenoids from species of *Plectranthus*

pp 1818–1825

Julia Wellsow, Renée J. Grayer, Nigel C. Veitch, Tetsuo Kokubun, Roberto Lelli, Geoffrey C. Kite, Monique S.J. Simmonds<sup>\*</sup>

Acetone extracts of leaves of species of *Plectranthus* (Lamiaceae) were tested for insect-antifeedant and antibacterial activity. An insect-antifeedant beyerane diterpenoid (**1**) was isolated from *P. saccatus*, together with several known abietane diterpenoids having both antibacterial and antifeedant activity from *P. puberulentus* and *P. forsteri* 'Marginatus'.



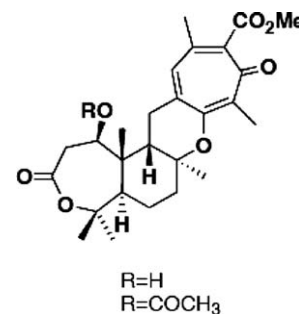
## BIOACTIVE PRODUCTS

### Tropolactones A–D, four meroterpenoids from a marine-derived fungus of the genus *Aspergillus*

pp 1826–1831

Mercedes Cueto, John B. MacMillan, Paul R. Jensen, William Fenical<sup>\*</sup>

Cytotoxic meroterpenoids, tropolactones A–D were isolated from the whole broth extract of a marine-derived fungus of the genus *Aspergillus*. Their structures were established through a variety of two-dimensional NMR techniques. The absolute configuration of tropolactone A was determined using the modified Mosher's method.

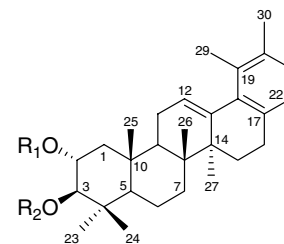


**Beccaridiol, an unusual 28-nortriterpenoid from the leaves of *Diplectria beccariana***

pp 1832–1837

Dae Sik Jang, Bao-Ning Su, Alison D. Pawlus, Young-Hwa Kang,  
Leonardus B.S. Kardono, Soedarsono Riswan, Johar J. Afriastini,  
Harry H.S. Fong, John M. Pezzuto, A. Douglas Kinghorn \*

A C<sub>29</sub>-triterpene, beccaridiol (1), a dihydrochalcone natural product, 2',4'-dihydroxy-3-(4-methoxyphenyl)-propiophenone, as well as three known compounds, have been isolated from an EtOAc-soluble extract of the leaves of *Diplectria beccariana*.



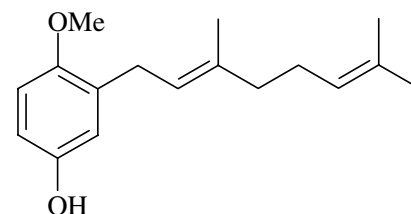
- 1 R<sub>1</sub> = R<sub>2</sub> = H  
 1a R<sub>1</sub> = COC<sub>6</sub>H<sub>4</sub>(p)Br R<sub>2</sub> = H  
 1b R<sub>1</sub> = R<sub>2</sub> = COC<sub>6</sub>H<sub>4</sub>(p)Br

**Antioxidant activity of prenylated hydroquinone and benzoic acid derivatives from *Piper crassinervium* Kunth**

pp 1838–1843

Lydia F. Yamaguchi, João Henrique G. Lago, Tatiane M. Tanizaki,  
Paolo Di Mascio, Massuo J. Kato \*

A prenylated hydroquinone derivative was isolated from leaves of *Piper crassinervium*. Its in vitro antioxidant capacity and other prenylated hydroquinones, 4-hydroxybenzoic acids, had their antioxidant activities evaluated using inhibition assays of luminol luminescence, DPPH, and lipoperoxidation.

**OTHER CONTENTS**

**Announcement: The Phytochemical Society of Europe**

p 1844

**Author Index**

p I

**Guide for Authors**

pp II–III

\* Corresponding author

The Editors encourage the submission of articles online, thus reducing publication times. For further information and to submit your manuscript, please visit the journal homepage at <http://www.elsevier.com/locate/phytochem>



ELSEVIER

ISSN 0031-9422

INDEXED/ABSTRACTED IN: *Current Awareness in Biological Sciences (CABS)*, *Curr Cont ASCA*, *Chem. Abstr.*, *BIOSIS Data*, *PASCAL-CNRS Data*, *CAB Inter*, *Cam Sci Abstr*, *Curr Cont/Agri Bio Env Sci*, *Curr Cont/Life Sci*, *Curr Cont Sci Cit Ind*, *Curr Cont SCISEARCH Data*, *Bio Agri Ind*. Also covered in the abstract and citation database SCOPUS®. Full text available on ScienceDirect®.

Available online at

 **ScienceDirect**  
[www.sciencedirect.com](http://www.sciencedirect.com)