

## Contents

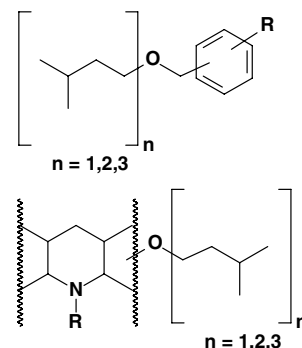
### REVIEWS

#### Chemistry and pharmacology of oxyprenylated secondary plant metabolites

pp 939–953

Francesco Epifano\*, Salvatore Genovese, Luigi Menghini, Massimo Curini

Oxyprenylated natural compounds represent a family of secondary metabolites that have been considered for years just as intermediates of *C*-prenylated ones. A wide variety of compounds containing a prenyloxy side chain have been characterized. In this review article the main structures so far reported in the literature, divided by chemical categories, with indication of their natural sources and biological activities are described. The review covers the major works presented in the literature, containing 88 references and 126 compounds.



#### Bioactive natural products from marine cyanobacteria for drug discovery

pp 954–979

Lik Tong Tan\*

Filamentous marine cyanobacteria continue to be an important source of secondary metabolites possessing potent biological and pharmacological properties. This article, with 96 references, provides a comprehensive review of 128 nitrogen-containing marine cyanobacterial natural products reported in the literature between January 2001 and December 2006.

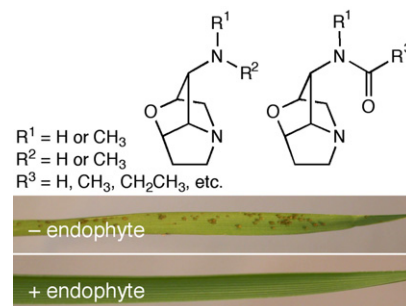


#### Loline alkaloids: Currencies of mutualism

pp 980–996

Christopher L. Schardl\*, Robert B. Grossman, Padmaja Nagabhyru, Jerome R. Faulkner, Uma P. Mallik

Increasingly, fungal endophytes are recognized for their roles in plant protection. Several seed-borne endophytes of grasses (Poaceae) produce lolines, which have potent broad-spectrum anti-insect activity. Lolines are structurally unusual pyrrolizidine alkaloids with a strained oxygen bridge. Here the structures, activities, distribution, genetics, biosynthesis and organic synthesis of lolines are reviewed.



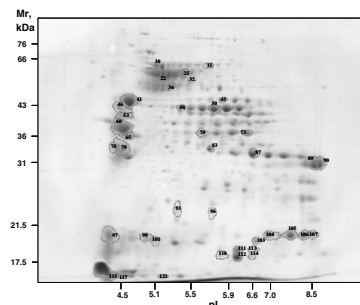
## PROTEIN BIOCHEMISTRY

### Combined 2D electrophoretic approaches for the study of white lupin mature seed storage proteome

pp 997–1007

Chiara Magni, Alessio Scarafoni, Anita Herndl, Fabio Sessa, Bhakti Prinsi, Luca Espen, Marcello Duranti\*

In this work, a combination of two experimental approaches to identify the main protein components of white lupin seed (*Lupinus albus*, L.) have been used. One is the canonical proteomic approach including 2D electrophoretic separation and mass spectrometry; the other approach is a group comparative 2D electrophoretic analysis of cotyledonary protein families. To this second purpose, the three main families of lupin seed proteins, namely  $\alpha$ -conglutins, the 11S globulin fraction,  $\beta$ -conglutins, the 7S globulin fraction, and  $\gamma$ -conglutin, a basic 7S protein, were isolated by conventional biochemical techniques and their 2D reference maps were compared with the total protein map.



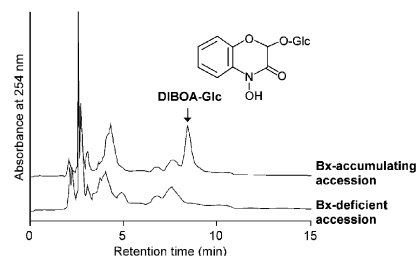
## MOLECULAR GENETICS AND GENOMICS

### Molecular characterization of benzoxazinone-deficient mutation in diploid wheat

pp 1008–1016

Taiji Nomura\*, Atsushi Ishihara, Hajime Iwamura, Takashi R. Endo

Accessions deficient in benzoxazinones (Bxs) were found in *Triticum boeoticum*, a wild A-genome diploid wheat. Molecular analyses of the five Bx biosynthetic genes (*TbBx1–TbBx5*) revealed that the Bx deficiency in *T. boeoticum* first resulted from disintegration of the *TbBx1* coding sequence, followed by transcription failure and elimination of the *TbBx* genes.



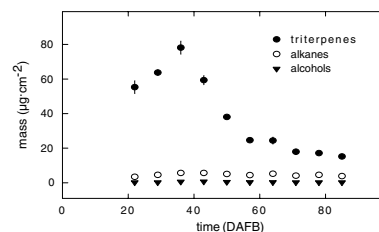
## METABOLISM

### Composition of the cuticle of developing sweet cherry fruit

pp 1017–1025

Stefanie Peschel, Rochus Franke, Lukas Schreiber, Moritz Knoche\*

Sweet cherry fruit wax consists of triterpenes, alkanes and alcohols, the cutin fraction is dominated by midchain-oxygenated hydroxyacids. Marked changes in composition of wax and cutin occurred during fruit development indicating that deposition of major constituents ceased during early development resulting in a thinning of the cuticle on the expanding fruit surface.

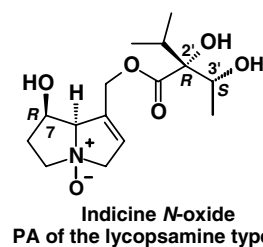


### Tissue distribution, core biosynthesis and diversification of pyrrolizidine alkaloids of the lycopsamine type in three Boraginaceae species

pp 1026–1037

Cordula Frölich, Dietrich Ober, Thomas Hartmann\*

Applying classical tracer techniques, the incorporation of  $^{14}\text{C}$  and  $^3\text{H}$  labeled precursor amino acids, amines and pyrrolizidine alkaloid (PA) intermediates was pursued to characterize the basic biosynthetic pathway and the species-specific strategies of structural diversification.

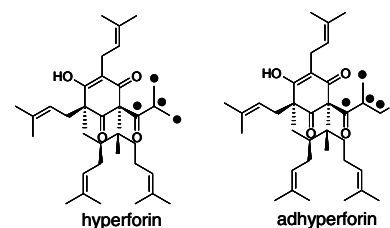


### Biosynthesis of hyperforin and adhyperforin from amino acid precursors in shoot cultures of *Hypericum perforatum*

pp 1038–1045

Katja Karppinen\*, Juho Hokkanen, Ari Tolonen, Sampo Mattila, Anja Hohtola

L-[U-<sup>13</sup>C<sub>5</sub>]Valine and L-[U-<sup>13</sup>C<sub>6</sub>]isoleucine, upon administration to shoot cultures of *Hypericum perforatum*, were incorporated into acyl side chain of hyperforin and adhyperforin, respectively. Precursor feeding with unlabelled L-isoleucine and L-threonine enhanced the production of adhyperforin in *H. perforatum* shoot cultures.



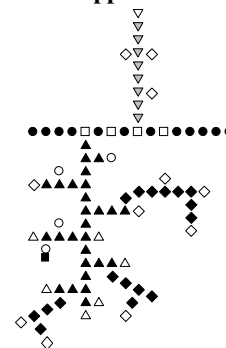
## BIOACTIVE PRODUCTS

### An immunomodulating pectic polymer from *Glinus oppositifolius*

pp 1046–1058

Kari T. Inngjerdingen\*, Hiroaki Kiyohara, Tsukasa Matsumoto, Dirk Petersen, Terje E. Michaelsen, Drissa Diallo, Marit Inngjerdingen, Haruki Yamada, Berit S. Paulsen

Tentative structure of the pectic polymer GOA1 isolated from *Glinus oppositifolius* (● = GalA, □ = Rha, ■ = T-Rha, ▲ = Gal involved in AG-II, ▼ = Gal involved in AG-I, △ = T-Gal, ◆ = Ara, ◇ = T-Ara, ○ = 4-O-Me GlcA/GlcA)

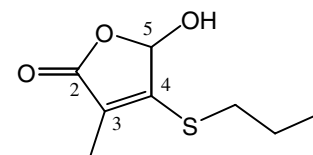


### Isolation and identification of potential cancer chemopreventive agents from methanolic extracts of green onion (*Allium cepa*)

pp 1059–1067

Hang Xiao, Kirk L. Parkin\*

A cellular bioassay was employed to direct the isolation of phase II enzyme inducers from methanolic extracts of green onion (*Allium cepa*). One identified compound, 5-hydroxy-3-methyl-4-propylsulfanyl-5H-furan-2-one (pictured), and four others, were isolated and confirmed to be quinone reductase and glutathione *S*-transferase inducers in vitro.

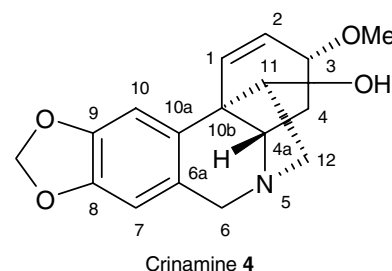


### Selective apoptosis-inducing activity of crinum-type Amaryllidaceae alkaloids

pp 1068–1074

James McNulty\*, Jerald J. Nair, Carles Codina, Jaume Bastida, Siyaram Pandey, Jenny Gerasimoff, Carly Griffin

The selective apoptosis-inducing activity of Amaryllidaceae alkaloids belonging to the crinane-type is reported. Crinamine **4** and haemanthamine **9** were shown to be potent inducers of apoptosis in tumour cells at micromolar concentrations. Structure-activity relationships demonstrated that both an alpha-5,10b-ethano bridge and a free hydroxyl at the C-11 position are pharmacophoric requirements of this activity.

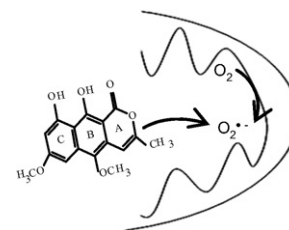


### Antioxidant activity of isocoumarins isolated from *Paepalanthus bromelioides* on mitochondria

pp 1075–1080

Karina F. Devienne, Anaísa F. Cálgaro-Helena, Daniel J. Dorta, Ieda M.R. Prado, Maria Stella G. Raddi, Wagner Vilegas, Sérgio A. Uyemura, Antonio C. Santos, Carlos Curti\*

The isocoumarins paepalantine, 8,8'-paepalantine dimer, and vioxanthin isolated from *Paepalanthus bromelioides*, were assessed for antioxidant activity on isolated rat liver mitochondria. Paepalantine was powerful agent affording protection, apparently via  $O_2^-$  scavenging, from oxidative stress conditions imposed on organelle.



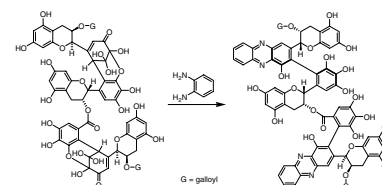
## CHEMISTRY

### Oxidative coupling of the pyrogallol B-ring with a galloyl group during enzymatic oxidation of epigallocatechin 3-*O*-gallate

pp 1081–1088

Yan Li, Takashi Tanaka\*, Isao Kouno

Unstable precursors of epigallocatechin-3-*O*-gallate trimer were isolated after condensation with *o*-phenylenediamine. The results suggested that oxidative coupling of the galloyl group with the B-ring proceeds by a quinone dimerization mechanism.



## OTHER CONTENTS

### Announcement: The Phytochemical Society of Europe

p I

\* 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)