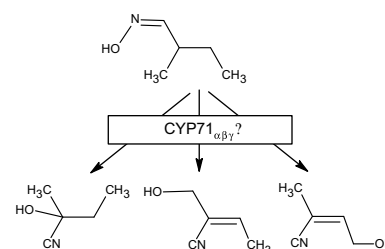


# Contents

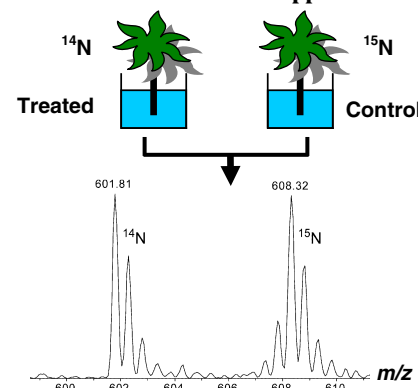
pp 1947-1961

Cyanogenic glucosides ( $\alpha$ -hydroxynitrile glucosides) frequently co-occur with  $\beta$ - and  $\gamma$ -hydroxynitrile glucosides, which are not cyanogenic. Based on literature data we propose a biosynthetic route for biosynthesis of  $\beta$ - and  $\gamma$ -hydroxynitriles mediated by evolutionary diversified multifunctional orthologs to CYP71E1. The possible biological functions of  $\beta$ - and  $\gamma$ -hydroxynitrile glucosides are discussed.



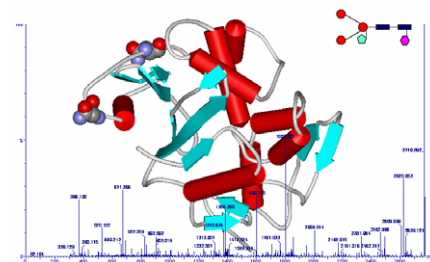
pp 1962-1972

HILEP is a cost-effective method enabling metabolic labelling of mature plants with a stable isotope (e.g.  $^{15}\text{N}$ ). HILEP, in combination with mass spectrometry, is suitable for quantitative plant proteomics. Differentially treated  $^{14}\text{N}$  and  $^{15}\text{N}$  grown plants were pooled and their relative protein amounts calculated from the  $^{14}\text{N}/^{15}\text{N}$  ion signal ratios.



pp 1973-1982

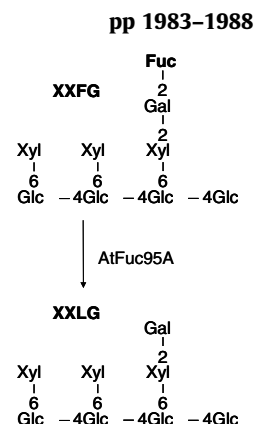
The amino acid sequence and the glycosylation motifs of three PD-Ss, ribosome-inactivating proteins isolated from *Phytolacca dioica* L. seeds, have been characterized by LC-peptide mapping assisted by Edman degradation and ESI-Q-TOF MS in precursor ion discovery mode.



### Identification of an *Arabidopsis* gene encoding a GH95 $\alpha$ 1,2-fucosidase active on xyloglucan oligo- and polysaccharides

Renaud Léonard<sup>\*</sup>, Martin Pabst, Jayakumar Singh Bondili, Gérard Chambat, Christiane Veit, Richard Strasser, Friedrich Altmann

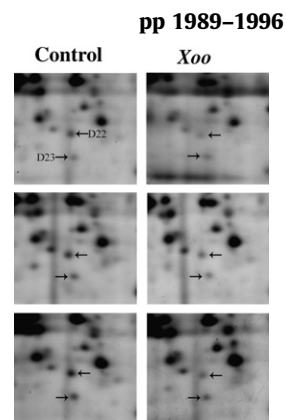
The gene encoding a GH95  $\alpha$ 1,2-fucosidase has been identified in *Arabidopsis thaliana*. The corresponding enzyme, AtFuc95A, is active on xyloglucan and xyloglucan fragments when recombinantly expressed in *Nicotiana benthamiana*.



### Pathogenesis-related proteins in somatic hybrid rice induced by bacterial blight

Chu L. Yu, Shun P. Yan, Chang C. Wang, Hai T. Hu, Wei N. Sun, Cheng Q. Yan, Jian P. Chen, Ling Yang<sup>\*</sup>

The bacterial blight resistance trait from *Oryza meyeriana*, a wild rice species, was introduced into an elite *japonica* rice cultivar using asymmetric somatic hybridization. Here, we describe the identification of differentially expressed proteins of incompatible interaction between bacterial blight and the stable somatic hybrids by using proteomic analyses.

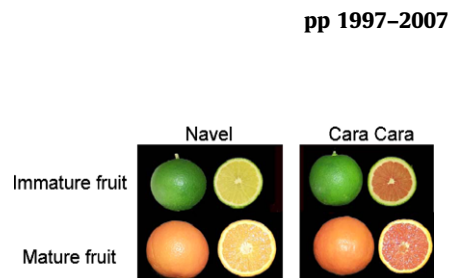


## MOLECULAR GENETICS AND GENOMICS

### Regulation of carotenoid biosynthesis during fruit maturation in the red-fleshed orange mutant Cara Cara

Berta Alquezar, Maria J. Rodrigo, Lorenzo Zacarías<sup>\*</sup>

Cara Cara is a spontaneous mutant of Navel orange (*Citrus sinensis*) with a red pulp due to the presence of lycopene. The comparative analysis of the methylerythritol phosphate (MEP) and carotenoid biosynthetic pathways in Navel and Cara Cara fruits during maturation revealed an enhanced expression of MEP genes in Cara Cara pulp that could result in an elevation of early carotenenes in the mutant.

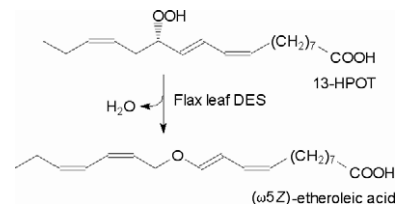


## METABOLISM

### A lipoygenase-divinyl ether synthase pathway in flax (*Linum usitatissimum* L.) leaves

Ivan R. Chechetkin, Alexander Blufard, Mats Hamberg, Alexander N. Grechkin<sup>\*</sup>

Flax leaf cell-free preparations possess lipoygenase and divinyl ether synthase activities. Linoleic or  $\alpha$ -linolenic acid (as well as their 13-hydroperoxides) are converted by these enzymes into divinyl ethers ( $\omega$ 5Z)-etheroleic and ( $\omega$ 5Z)-etherolenic acids, respectively. Identification of both divinyl ethers was substantiated by their UV, mass-, <sup>1</sup>H NMR and COSY spectral data.

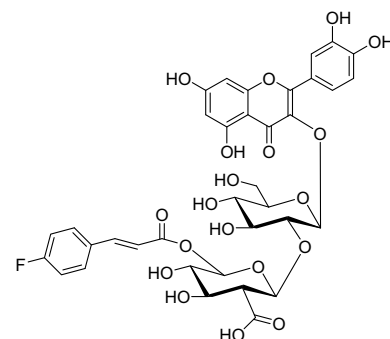


**Modifying the acylation of flavonols in *Petunia hybrida***

pp 2016–2021

Oliver D. Cunningham, Robert Edwards\*

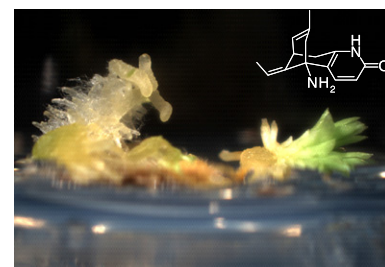
Treatment of petunia leaves with methyl esters of caffeic and ferulic acid resulted in major increases in the concentrations of naturally-occurring caffeoylated and feruloylated flavonol glycosides. Feeding with methyl coumarate resulted in the formation of a acylated flavonoid, with the bioisostere 4-fluorocinnamic acid forming the corresponding fluoroacylated derivative.

**In vitro production of huperzine A, a promising drug candidate for Alzheimer's disease**

pp 2022–2028

Xiaoqiang Ma, David R. Gang\*

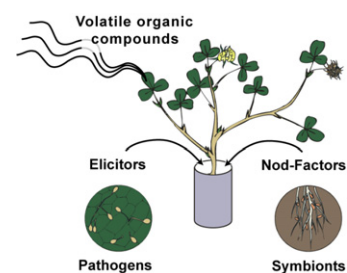
In vitro propagation of *Phlegmariurus squarrosus* for production of huperzine A in culture was established in this paper.

**ECOLOGICAL BIOCHEMISTRY****Microbial oligosaccharides differentially induce volatiles and signalling components in *Medicago truncatula***

pp 2029–2040

Margit Leitner, Roland Kaiser, Martin O. Rasmussen, Hugues Driguez, Wilhelm Boland, Axel Mithöfer\*

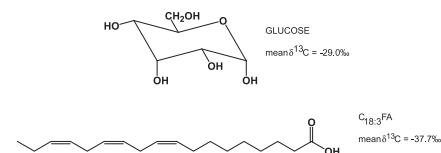
In a bioassay-based approach microbial oligosaccharidic signals (pathogen elicitors and Nod-factors) were demonstrated to induce distinct emission patterns of volatile organic compounds. As potential mediators of this response changing levels of jasmonic acid and salicylic acid as well as overproduction of reactive oxygen species and nitric oxide were monitored.

**Interspecific variation in bulk tissue, fatty acid and monosaccharide  $\delta^{13}\text{C}$  values of leaves from a mesotrophic grassland plant community**

pp 2041–2051

Jennifer A.J. Dungait, Gordon Docherty, Vanessa Straker, Richard P. Evershed\*

$\delta^{13}\text{C}$  values were determined for methyl esters of fatty acids  $\text{C}_{16:0}$ ,  $\text{C}_{18:2}$  and  $\text{C}_{18:3}$ , and alditol acetates of monosaccharides glucose, xylose, arabinose, galactose and mannose, from tree, shrub, herb and grass leaves of a mesotrophic grassland plant community, using GC–C–IRMS.

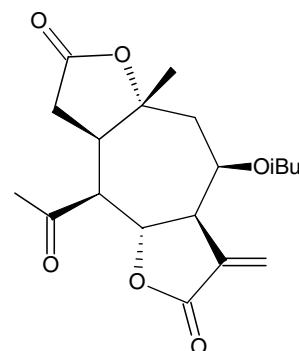


### Constituents of glandular trichomes of *Tithonia diversifolia*: Relationships to herbivory and antifeedant activity

pp 2052–2060

Sérgio Ricardo Ambrósio, Yumi Oki, Vladimir Constantino Gomes Heleno, Juliana Siqueira Chaves, Paulo Gustavo Barboni Dantas Nascimento, Juliana Espada Lichston, Mauricio Gomes Constantino, Elenice Mouro Varanda, Fernando Batista Da Costa\*

The herbivory activity of the bordered patch larvae (*Chlosyne lacinia*) on leaves of a Brazilian population of *Tithonia diversifolia* and the antifeedant potential of its leaf rinse extract were investigated. Our findings indicate that the caterpillars avoid the sesquiterpene-lactone-rich glandular trichomes, and provide evidence for the antifeedant activity of this class of compounds.



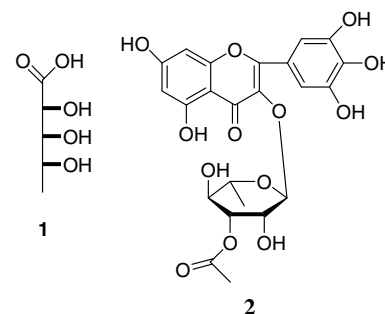
## BIOACTIVE PRODUCTS

### Antioxidant constituents of *Nymphaea caerulea* flowers

pp 2061–2066

Vijai K. Agnihotri, Hala N. ElSohly, Shabana I. Khan, Troy J. Smillie, Ikhlas A. Khan\*, Larry A. Walker

Twenty constituents were isolated from the *Nymphaea caerulea* flowers, including 2S,3S,4S-trihydroxypentanoic acid (**1**), and myricetin 3-O-(3''-O-acetyl)- $\alpha$ -L-rhamnoside (**2**), along with known 18 compounds (**3–20**). Antioxidant activities of nine compounds **2–7**, **11**, **12** and **18** were observed with  $IC_{50}$  values of 1.16, 4.1, 0.75, 1.7, 1.0, 0.34, 11.0, 1.7 and 0.95  $\mu$ g/ml, respectively, while **1** was marginally active ( $IC_{50} > 31.25$   $\mu$ g/ml). Promising activity of EtOAc fraction ( $IC_{50}$  0.2  $\mu$ g/ml) could be attributed to the synergistic effect of the compounds present in it.

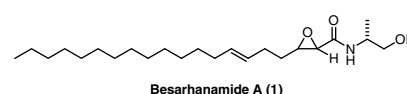


### Besarhanamides A and B from the marine cyanobacterium *Lyngbya majuscula*

pp 2067–2069

Lik Tong Tan\*, Ying Yan Chang, Tripathi Ashootosh

Tropical marine cyanobacteria continue to be an important source of bioactive secondary metabolites. This article describes the isolation and structural determination of two acyl-amide-type molecules, besarhanamides A and B, from the marine cyanobacterium, *Lyngbya majuscula*, collected from Singapore.



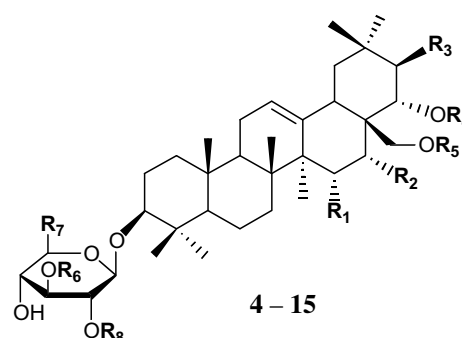
## CHEMISTRY

### Phenolic compounds and rare polyhydroxylated triterpenoid saponins from *Eryngium yuccifolium*

pp 2070–2080

Zhizhen Zhang, Shiyu Li\*, Stacy Ownby, Ping Wang, Wei Yuan, Wanli Zhang, R. Scott Beasley

The isolation and structural elucidation of three phenolic compounds (**1–3**) and 12 saponins eryngiosides A–L (**4–15**) from *Eryngium yuccifolium* Michx. are reported.

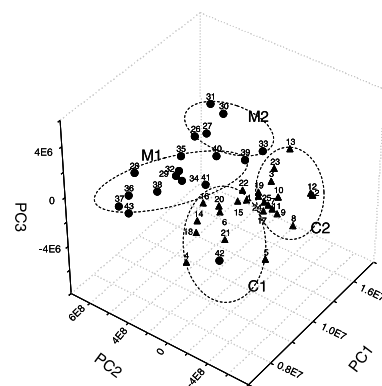


**Quality evaluation of Astragali Radix using a multivariate statistical approach**

pp 2081–2087

Ken Tanaka, Takayuki Tamura, Shoko Fukuda, Javzan Batkhuu, Chinbat Sanchir, Katsuko Komatsu\*

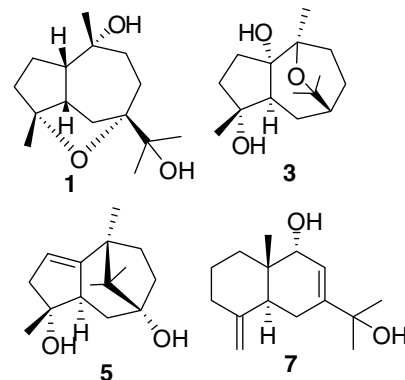
Quality of 43 Astragali Radix samples collected in China and Mongolia was evaluated by multivariate statistical analysis of liquid chromatography-ion trap-time of flight mass spectrometric data. The samples were classified into four groups and the most of marker compounds were identified by the elemental composition and MS/MS analysis.

**Three types of sesquiterpenes from rhizomes of *Atractylodes lancea***

pp 2088–2094

He-Xiang Wang, Chun-Mei Liu, Quan Liu, Kun Gao\*

A rare tricyclic carbon skeleton-type, three eudesmane-type and four guaiane-type sesquiterpenes were isolated from the rhizomes of *Atractylodes lancea*. Compounds **1**, **2** and **4** were evaluated for their cytotoxic effects against P388 and A549 cells but all were inactive.

**OTHER CONTENTS****Erratum**

p 2095

**Announcement: Phytochemical Society of North America**

p I

\* Corresponding author

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