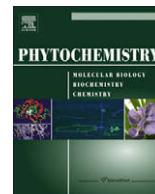




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## Phytochemistry Vol. 69, No. 17, 2008

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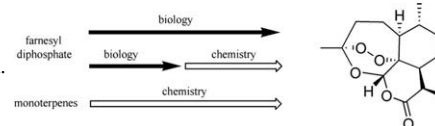
## MOLECULES OF INTEREST

## Making artemisinin

pp 2881–2885

Patrick S. Covello\*

The possibilities for the production of the antimalarial artemisinin by biological and chemical synthesis are explored.



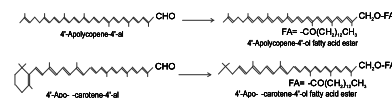
## METABOLISM

C<sub>35</sub>-apocarotenoids in the yellow mutant *Neurospora crassa* YLO

pp 2886–2890

Gerhard Sandmann\*, Shinishi Takaichi, Paul D. Fraser

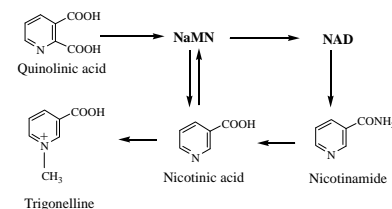
The *Neurospora crassa* mutant YLO exhibits a yellow phenotype instead of the red-orange pigmentation of the wild type. Through chemical analysis the predominant carotenoids in the YLO mutant are 4'-apocyclopene-4'-myristate and 4'-apo-γ-carotene-4'-myristate. They originate from 4'-Apocyclopene-4'-al and 4'-Apo-γ-carotene-4'-al, respectively, by reduction and esterification.

Changes in pyrimidine metabolism profile during growth of trigonelline-forming *Lotus japonicus* cell cultures

pp 2891–2898

Yuling Yin, Ayu Matsui, Masaaki Sakuta, Hiroshi Ashihara\*

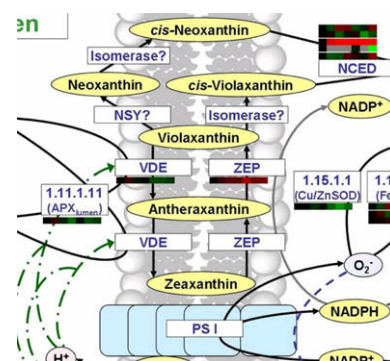
Metabolism of [<sup>3</sup>H] quinolinic acid and [<sup>14</sup>C] nicotinamide was monitored in *Lotus japonicus* cell cultures during growth. The increase in nicotinamide salvage in the lag phase may be due to an increase in activity of nicotinate phosphoribosyltransferase and nicotinamidase, depending primarily on gene expression. Trigonelline formation was particularly pronounced in later growth stages.



### Absciscic acid-induced modulation of metabolic and redox control pathways in *Arabidopsis thaliana*

Majid Ghassemian, Jason Lutes, Hur-Song Chang, Iris Lange, Wenqiong Chen, Tong Zhu, Xun Wang, B. Markus Lange\*

The effects of abscisic acid treatment on biochemical pathways in *Arabidopsis thaliana* were analyzed by transcript and metabolite profiling, and results were integrated using the recently developed BioPathAt tool. Besides the expected upregulation of pathways related to the biosynthesis of compatible solutes (raffinose family oligosaccharides and certain amino acids), we observed a downregulation of numerous genes putatively localized to and possibly involved in the reorganization of cell walls, an association that had not been recognized previously. The induced biosynthesis of the antioxidants ascorbic acid and  $\alpha$ -tocopherol appeared to be integrated into a network of reactions controlling the levels of reactive oxygen species.

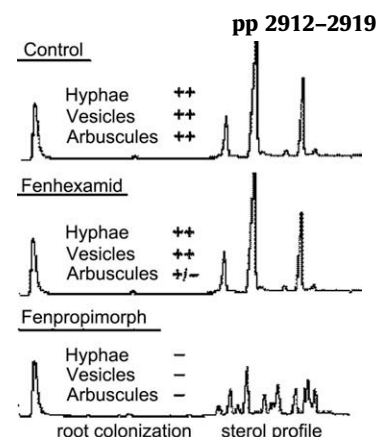


pp 2899–2911

### Differential effects of fenpropimorph and fenhexamid, two sterol biosynthesis inhibitor fungicides, on arbuscular mycorrhizal development and sterol metabolism in carrot roots

Estelle Campagnac, Joël Fontaine, Anissa Lounès-Hadj Sahraoui, Frédéric Laruelle, Roger Durand, Anne Grandmougin-Ferjani\*

Two sterol biosynthesis inhibitor fungicides affect differently sterols and arbuscular mycorrhizal (AM) development of carrots roots. Fenhexamid affects the frequency of arbuscules without change in sterol profile, whereas fenpropimorph causes modifications of sterol composition with an apparition of unusual sterols as well as a drastic reduction in the AM fungus.

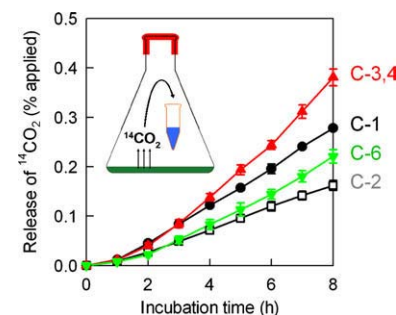


pp 2912–2919

### Validation of the design of feeding experiments involving [ $^{14}\text{C}$ ]substrates used to monitor metabolic flux in higher plants

Peter W. Harrison, Nicholas J. Kruger\*

The use of ratios of  $^{14}\text{CO}_2$  release from different combinations of positionally labelled [ $^{14}\text{C}$ ]substrates to provide information on flux through the principal pathways of carbohydrate oxidation is validated. Metabolism in *Arabidopsis thaliana* cell suspension cultures was unaffected by the presence of alkali used to trap respired  $^{14}\text{CO}_2$ . Although capture of released label was incomplete, alkali traps absorbed a representative proportion of  $^{14}\text{CO}_2$  generated by metabolism, and re-assimilation of released  $^{14}\text{CO}_2$  was negligible. However, caution is needed in evaluating the absolute amount of  $^{14}\text{CO}_2$  generated in typical feeding studies.

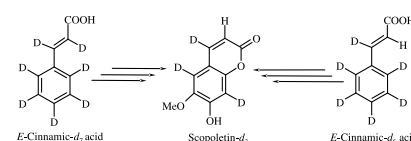


pp 2920–2927

### Biosynthesis of scopoletin and scopolin in cassava roots during post-harvest physiological deterioration: The E-Z-isomerisation stage

Soad A.L. Bayoumi, Michael G. Rowan, Ian S. Blagbrough\*, John R. Beeching

In cassava roots under PPD, the E-Z-isomerisation stage of cinnamic acid is enzymatic not photochemical.



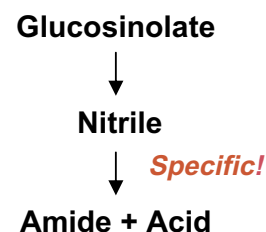
pp 2928–2936

**Sinapis phylogeny and evolution of glucosinolates and specific nitrile degrading enzymes**

pp 2937–2949

Niels Agerbirk\*, Suzanne I. Warwick, Paul R. Hansen, Carl E. Olsen

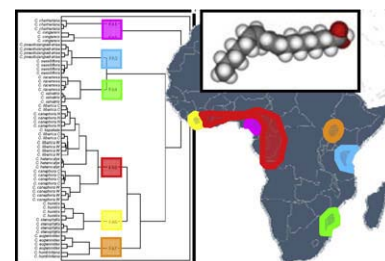
The crucifers *Sinapis alba* and *Sinapis arvensis* are distantly related but both contain 4-hydroxybenzylglucosinolate (sinalbin) and enzymatic activity converting the corresponding nitrile to amide and carboxylic acid. Distribution of 4-hydroxyphenylacetonitrile degrading activity and 27 glucosinolates in the genus *Sinapis* and related species is presented. The specificity of the reaction and low nitrile degrading activity in related species both with and without sinalbin, suggest a facultative metabolic connection with sinalbin that evolved twice.

**CHEMOTAXONOMY****Effectiveness of the fatty acid and sterol composition of seeds for the chemotaxonomy of *Coffea* subgenus *Coffea***

pp 2950–2960

Stéphane Dussert\*, Andréina Laffargue, Alexandre de Kochko, Thierry Joët

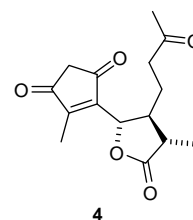
Clustering of *Coffea* species based on their seed fatty acid composition showed remarkable ecological and geographical coherence. Groups were also outstandingly congruent with the phylogenetic clades inferred from nuclear and plastid DNA sequences.

**BIOACTIVE PRODUCTS****Sesquiterpene lactones from the endemic Cape Verdean *Artemisia gorgonum***

pp 2961–2965

Risoleta Ortet, Soizic Prado, Elisabeth Mouray, Olivier P. Thomas\*

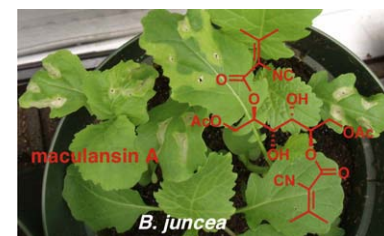
Phytochemical study of *Artemisia gorgonum* Webb resulted in characterisation of three guaianolides (**1**, **2**, **5**) and a secoguainolide **4** along with eight known sesquiterpene lactones (**6–13**). 2D NMR studies also led to revision of the structure of guaianolide **3**.

**Structure and biological activity of maculansin A, a phytotoxin from the phytopathogenic fungus *Leptosphaeria maculans***

pp 2966–2971

M. Soledade C. Pedras\*, Yang Yu

Maculansin A, a unique derivative of mannitol containing the unusual chromophore 2-isocyano-3-methyl-2-butenoyl, was isolated from potato dextrose cultures of *L. maculans* virulent on canola (*Brassica napus*). Surprisingly, maculansin A was more toxic to resistant plants (*B. juncea* L.) than to susceptible plants (canola).



### Carbohydrate-binding activity of the type-2 ribosome-inactivating protein SNA-I from elderberry (*Sambucus nigra*) is a determining factor for its insecticidal activity

pp 2972–2978

Shahnaz Shahidi-Noghabi, Els J.M. Van Damme\*, Guy Smagghe

It has been proposed that ribosome-inactivating proteins play a role in plant protection against insects. Here we demonstrated that *Sambucus nigra* agglutinin I has potency to control aphid pests (the pea aphid *Acyrtosiphon pisum* and the tobacco aphid *Myzus nicotianae*) via artificial diet and transgenic plants, and that carbohydrate-binding activity is crucial for this insecticidal activity.

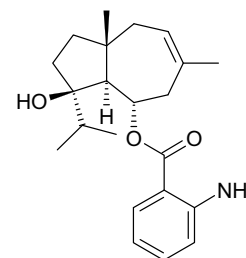


### Activity of elaeochytrin A from *Ferula elaeochytris* on leukemia cell lines

pp 2979–2983

Racha Alkhatib, Thierry Hennebelle\*, Sami Joha, Thierry Idziorek, Claude Preudhomme, Bruno Quesnel, Sevser Sahpaz, François Bailleul

Two sesquiterpene esters and eight known compounds were tested against murine leukemia dasatinib-resistant (DA1-3b/M2<sup>BCR-ABL</sup>) and human imatinib-resistant (K562R) cell lines. The most active compound was elaeochytrin A (IC<sub>50</sub> = 7.8 and 12.4 μM, respectively).



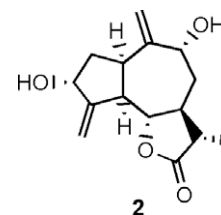
## CHEMISTRY

### Chemical characterisation of the terpenoid constituents of the Algerian plant *Launaea arborescens*

pp 2984–2992

Fatma Bitam, M. Letizia Ciavatta, Emiliano Manzo, Ammar Dibi, Margherita Gavagnin\*

Chemical study of this desertic plant yielded a series of triterpenes and sesquiterpenes (e.g. 2) fully characterised using NMR and mass data.

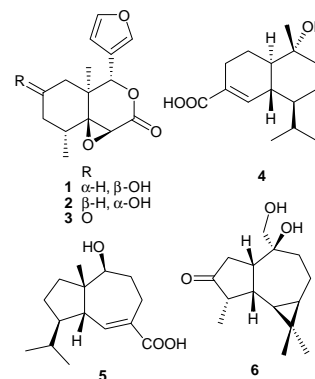


### Terpenoids from *Dysoxylum densiflorum*

pp 2993–2997

Bo-Jun Xie, Sheng-Ping Yang, Jian-Min Yue\*

Three degraded limonoids, dysodensiols A–C (**1–3**), and three sesquiterpenoids, dysodensiols D–F (**4–6**), along with 17 known compounds, were isolated from the twigs and leaves of *Dysoxylum densiflorum*. The structures of compounds **1–6** were established on the basis of extensive spectroscopic analyses.



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\* Corresponding author

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