

Phytochemistry Vol. 66, No. 13, 2005

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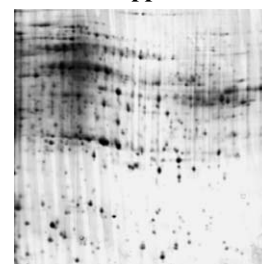
PROTEIN BIOCHEMISTRY

**Proteome analysis of maize roots reveals that oxidative stress is a main contributing factor to plant arsenic toxicity**

pp 1519–1528

Raquel Requejo, Manuel Tena\*

Seven out of eleven identified maize root proteins highly responsive to arsenic exposure constitute a functionally homogeneous group of enzymes involved in cellular homeostasis for redox perturbation, thus suggesting that induction of oxidative stress is a main process underlying arsenic toxicity in plants.



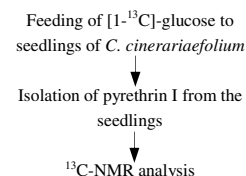
METABOLISM

**Biosynthesis of pyrethrin I in seedlings of *Chrysanthemum cinerariaefolium***

pp 1529–1535

Kazuhiko Matsuda\*, Yukio Kikuta, Atsushi Haba, Koji Nakayama, Yoshio Katsuda, Akikazu Hatanaka, Koichiro Komai

[1-<sup>13</sup>C]-Glucose was employed as a precursor to elucidate the biosynthetic pathway for pyrethrin I in the seedlings of *Chrysanthemum cinerariaefolium*.



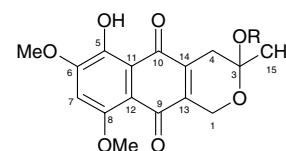
ECOLOGICAL BIOCHEMISTRY

**Chickpea wilt: identification and toxicity of 8-O-methyl-fusarubin from *Fusarium acutatum***

pp 1536–1539

Subramaniam Gopalakrishnan, Michael H. Beale, Jane L. Ward, Richard N. Strange\*

A plant toxin isolated from the fungus *Fusarium acutatum* was identified as 8-O-methyl-fusarubin.

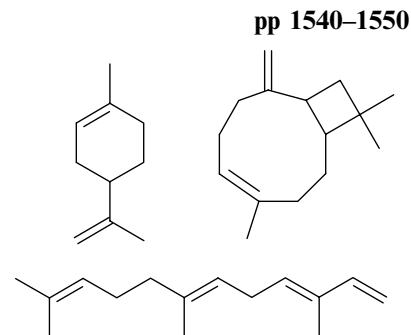


- (1) R = H. 8-O-Methyl-fusarubin  
(2) R = Me. 3-O-Methyl-8-O-methyl-fusarubin

## How rainfall, relative humidity and temperature influence volatile emissions from apple trees in situ

Armelle Vallat, Hainan Gu, Silvia Dorn\*

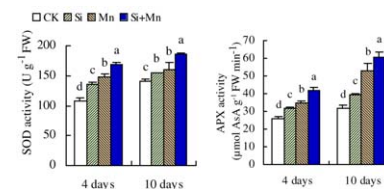
Volatile emissions from apple trees as analysed by TD–GC–MS increased with water deficit stress, i.e. lacking rainfall. Compound-specific relationships were found regarding correlation of release with temperature and RH, e.g. limonene,  $\beta$ -caryophyllene and (*E,E*)- $\alpha$ -farnesene were negatively correlated with these climatic parameters.



## Silicon-mediated alleviation of Mn toxicity in *Cucumis sativus* in relation to activities of superoxide dismutase and ascorbate peroxidase

Qinghua Shi, Zhiyi Bao, Zhujun Zhu\*, Yong He, Qiongqiu Qian, Jingquan Yu

The effects of exogenous silicon on plant growth, activities of superoxide dismutase, guaiacol peroxidase, ascorbate peroxidase, dehydroascorbate reductase, glutathione reductase and catalase, and concentrations of ascorbate and glutathione were investigated in cucumber (*Cucumis sativus* L.) plants treated with excess 600  $\mu$ M Mn. The alleviation of Mn toxicity by Si was related to a significant increase in the activities of SOD, APX, DHAR and GR and the concentrations of ascorbate and glutathione.

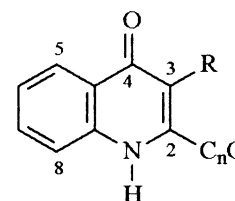


## CHEMOTAXONOMY

### Alkaloids from *Spathelia excelsa*: Their chemosystematic significance

M. da Paz Lima, Lisandra Vieira Rosas, M. Fátima das G.F. da Silva\*, A. Gilberto Ferreira, João B. Fernandes, Paulo C. Vieira

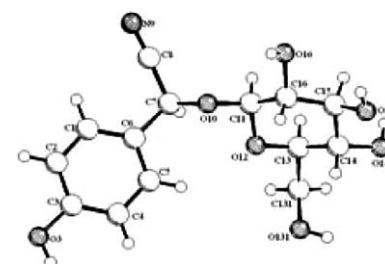
*Spathelia excelsa* afforded six new alkaloids 2-(12-oxo-tridecanyl)-3-methoxy-4-quinolone, 2-(10'-hydroxy-10'-methyldeceanyl)-3-methoxy-4-quinolone, 2-(11'-hydroxy-11'-methyldeceanyl)-3-methoxy-4-quinolone, 2-(12'-hydroxytridecanyl)-3-methoxy-4-quinolone, 7-hydroxy-2-(3'-hydroxy-3'-methylbutyl)-4-quinolone, 6-hydroxy-2-(3'-hydroxy-3'-methylbutyl)-4-quinolone. The data provide firm support for removing Spathelioideae to or within the Dictyolomatoideae.



### Cyanogenic glycosides and menisdaurin from *Guazuma ulmifolia*, *Ostrya virginiana*, *Tiquilia plicata*, and *Tiquilia canescens*

David S. Seigler\*, Guido F. Pauli, Roland Fröhlich, Elina Wegelius, Adolf Nahrstedt, Kenneth E. Glander, John E. Ebinger

Leaf material of *Guazuma ulmifolia* (Sterculiaceae) contains mainly the cyanogenic glycoside (2*R*) taxiphyllin, whereas that of *Ostrya virginiana* (Betulaceae) contains primarily (2*S*)-dhurrin (**1a**). This cpd co-occurs in *Tiquilia canescens* and *Tiquilia plicata* (Boraginaceae) with the nitrile glucoside menisdaurin. The compounds were identified by NMR spectroscopy and the structure of **1a** was determined by X-ray crystallography.



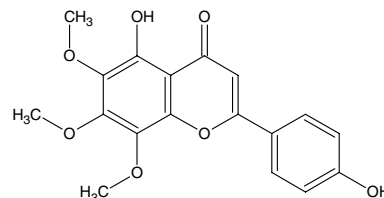
## BIOACTIVE PRODUCTS

**Xanthomicrol is the main cytotoxic component of *Dracocephalum kotschyii* and a potential anti-cancer agent**

pp 1581–1592

Fereshteh Jahaniani, Soltan Ahmed Ebrahimi, Nahid Rahbar-Roshandel, Massoud Mahmoudian\*

Xanthomicrol (5,4'-dihydroxy-6,7,8-trimethoxyflavone) isolated from *Dracocephalum kotschyii* leaf extract has potent and selective cytotoxic effect against a panel of human cancer cell lines and may be a potential anti-cancer agent.



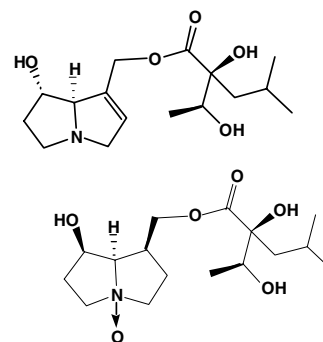
Xanthomicrol

**Pyrrolizidine alkaloids from *Anchusa strigosa* and their antifeedant activity**

pp 1593–1600

Tiziana Siciliano, Marinella De Leo, Ammar Bader, Nunziatina De Tommasi, Klaas Vrieling, Alessandra Braca\*, Ivano Morelli

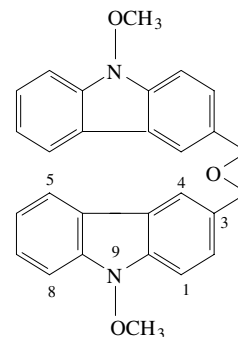
The pyrrolizidine alkaloid (PA) content of flowers, leaves, and roots of *Anchusa strigosa* (Boraginaceae) was analysed by ESI–LC–MS. Six PAs, including two natural compounds were detected, characterized by NMR spectroscopy, and quantified in each plant organ. The highest total concentration of PAs was in the leaves, followed by the flowers, and finally by the roots. All PAs isolated were subjected to *Spodoptera exigua* and *Pieris brassicae* larvae. Feeding activity by both herbivore species using a bioassay was inhibited up to circa 75% depending on applied concentration and PA.

**A benzoisofuranone derivative and carbazole alkaloids from *Murraya koenigii* and their antimicrobial activity**

pp 1601–1606

M. Mukhlesur Rahman\*, Alexander I. Gray

3ξ-(1ξ-Hydroxyethyl)-7-hydroxy-1-isobenzofuranone and 3,3'-[oxybis(methylene)]bis(9-methoxy-9H-carbazole) along with six known carbazole alkaloids and three known steroids were isolated from the stem bark of *Murraya koenigii*. The antimicrobial activities of these compounds were investigated.



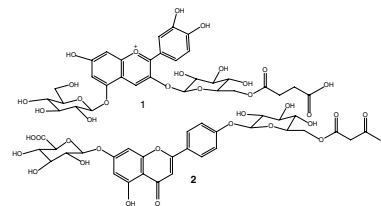
## CHEMISTRY

**Components of protocyanin, a blue pigment from the blue flowers of *Centaurea cyanus***

pp 1607–1613

Kosaku Takeda\*, Akiko Osakabe, Shinomi Saito, Daisuke Furuyama, Atsuko Tomita, Yumi Kojima, Mayumi Yamadera, Masaaki Sakuta

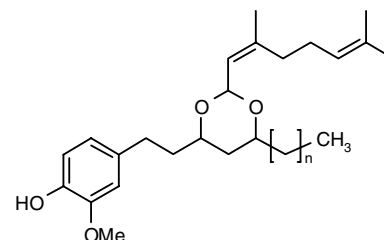
The components of protocyanin were shown to be cyanidin 3-*O*-(6-*O*-succinylglucoside)-5-*O*-glucoside **1**, apigenin 7-*O*-glucuronide-4'-*O*-(6-*O*-malonylglucoside) **2** and metals, Fe, Mg and Ca, by reconstruction experiments. Substitution of the metal components in protocyanin with other metals was also examined.



**Commercially processed dry ginger (*Zingiber officinale*): Composition and effects on LPS-stimulated PGE<sub>2</sub> production****pp 1614–1635**

Shivanand D. Jolad, R. Clark Lantz, Guan Jie Chen, Robert B. Bates, Barbara N. Timmermann\*

Direct analysis of partially purified fractions of commercially processed dry ginger extract by GC-MS resulted in the identification of 115 compounds including 33 new compounds and 3 others previously unreported from ginger.

**OTHER CONTENTS****Book review****pp 1636–1637****Announcement: The Phytochemical Society of Europe****p 1638****Author Index****p I****Guide for Authors****pp II–III**

\*Corresponding author

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