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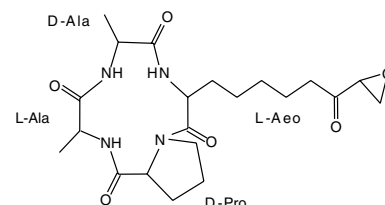
MOLECULES OF INTEREST

HC-toxin

pp 1406–1413

Jonathan D. Walton*

HC-toxin is a virulence factor for the plant pathogenic fungus *Cochliobolus* (*Helminthosporium*) *carbonum*. Specific resistance to HC-toxin and *C. carbonum* is controlled by Mendelian genes in maize that encode carbonyl reductases, which detoxify HC-toxin by reducing the carbonyl group of Aeo. Analogs of HC-toxin are made by at least five other fungi. Biosynthesis of HC-toxin involves at least five genes that are present in two or three functional copies over a ~500 kb region. The genes are absent from natural toxin non-producing isolates of *C. carbonum*. HC-toxin is a universal inhibitor of histone deacetylases of the Rpd3/Hda1 class.



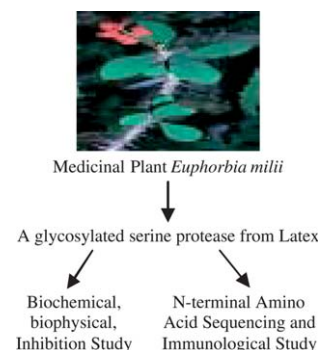
PROTEIN BIOCHEMISTRY

Highly stable glycosylated serine protease from the medicinal plant *Euphorbia milii*

pp 1414–1426

Subhash C. Yadav, Monu Pande, M.V. Jagannadham*

A glycosylated serine protease from the latex of medicinal plant *Euphorbia milii* has been isolated, and comprehensively studied. Its activity over a broad range of pH and temperature, high stability against the chemical and physiological denaturants and less susceptibility to autodigestion makes the enzyme applicable in biotechnology industries.



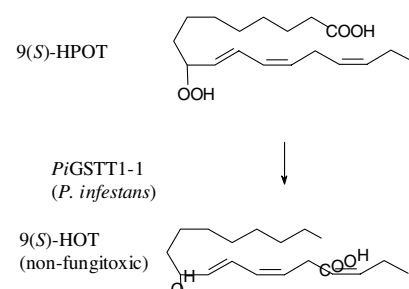
MOLECULAR GENETICS AND GENOMICS

Cloning and characterization of a theta class glutathione transferase from the potato pathogen *Phytophthora infestans*

pp 1427–1434

David Bryant, Ian Cummins, David P. Dixon, Robert Edwards*

Potato plants produce the 9(*S*)-hydroperoxide of linolenic acid (9(*S*)-HPOT) as a precursor of fungitoxic oxylipins. A constitutively expressed glutathione transferase from the potato pathogen *Phytophthora infestans* can reduce 9(*S*)-HPOT to the non-toxic mono-hydroxyalcohol 9(*S*)-HOT.

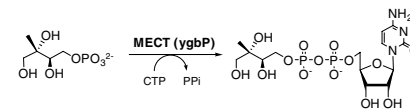


Cloning and functional characterization of 2-C-methyl-D-erythritol 4-phosphate cytidyltransferase (GbMECT) gene from *Ginkgo biloba*

pp 1435–1441

Sang-Min Kim, Tomohisa Kuzuyama, Yung-Jin Chang, Hyung-Jin Kwon, Soo-Un Kim*

2-C-methyl-D-erythritol 4-phosphate cytidyltransferase gene was cloned from *Ginkgo biloba* and functionally characterized. Transient expression of this protein in the chloroplast of *Arabidopsis* was observed, confirming its subcellular localization.

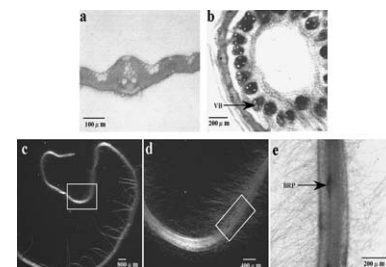


OsBLE3, a brassinolide-enhanced gene, is involved in the growth of rice

pp 1442–1454

Guangxiao Yang, Hidemitsu Nakamura, Hiroaki Ichikawa, Hidemi Kitano, Setsuko Komatsu*

Brassinosteroids (BRs) are a group of plant hormones involved in a wide range of plant growth and developmental processes. To investigate the mechanism of BR action in monocots, a brassinolide (BL) upregulated gene designated *OsBLE3* was identified, cloned and characterized in rice. *OsBLE3* is involved in cell elongation in rice through regulation by both BL and IAA.



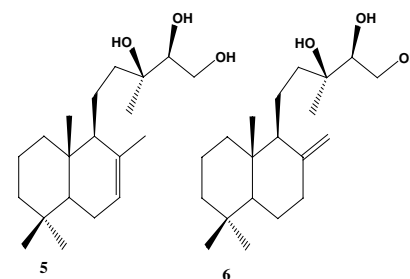
METABOLISM

Microbiological transformation of two labdane diterpenes, the main constituents of *Madia* species, by two fungi

pp 1455–1459

Mamdouh S.A. Haridy, Ahmed A. Ahmed*, Matsumi Doe

Microbial transformation of 13*R*,14*R*,15-trihydroxylabd-7-ene (**5**) and 13*R*,14*R*,15-trihydroxylabd-8,17-ene (**6**) by the fungus *Debaryomyces hansenii* gave **1** and **3**, respectively. While, microbial transformation of **5** by *Aspergillus niger* afforded **2**, and 13*R*,14*R*,15-trihydroxylabd-8,17-ene (**6**) gave **3** and **4**. The structures of the new compounds, **1** and **2**, were assigned by 1D and 2D high-field NMR spectroscopic methods. Antimicrobial activity of these compounds were tested and their MIC were determined.

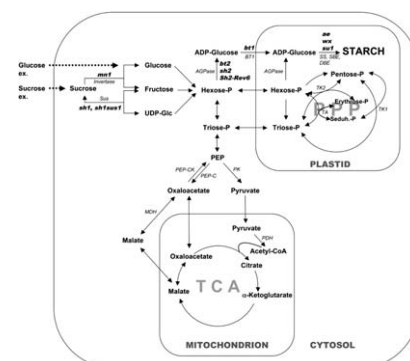


Robustness of central carbohydrate metabolism in developing maize kernels

pp 1460–1475

Gertraud Spielbauer, Lilla Margl, L. Curtis Hannah, Werner Römisch, Christian Etenhuber, Adelbert Bacher, Alfons Gierl, Wolfgang Eisenreich, Ulrich Genschel*

Large-scale stable isotope labeling experiments were carried out in order to study metabolic fluxes of the central carbohydrate network in developing maize kernels. Similar labeling patterns of starch-derived glucose from 19 different genotypes indicated robustness of carbohydrate fluxes in maize endosperm.

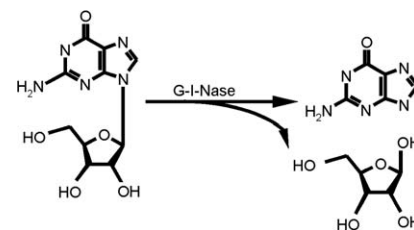


Calcium-stimulated guanosine–inosine nucleosidase from yellow lupin (*Lupinus luteus*)

pp 1476–1485

Maciej Szuwart, Elżbieta Starzyńska, Małgorzata Pietrowska-Borek, Andrzej Guranowski*

The purification to homogeneity and characterization of the calcium-stimulated guanosine–inosine nucleosidase (G-I-Nase) of yellow lupin (*Lupinus luteus*) seeds is presented.



ECOLOGICAL BIOCHEMISTRY

Nutritional content of fresh, bee-collected and stored pollen of *Aloe greatheadii* var. *davyana* (Asphodelaceae)

pp 1486–1492

Hannelie Human*, Sue W. Nicolson

The first study to characterise changes in pollen of a single species after collection by honeybees reports highly significant differences. The addition of nectar to fresh pollen results in increased water and carbohydrate content, and decrease in crude protein and lipid content.

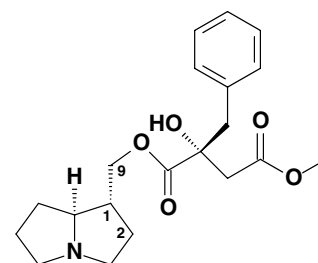
	Fresh	Type of pollen Bee-collected	Stored
Water content (%)	12.6 (2.4)	18.9 (2.3)	21.0 (2.4)
Crude protein (%)	22.8 (2.7)	21.4 (2.5)	20.1 (2.8)
Lipids (%)	18.0 (1.4)	8.2 (0.9)	7.6 (0.2)
Ash (Ca) (%)	4.6 (0.2)	3.8 (0.2)	3.6 (0.2)
Carbohydrate (%)	24.7 (2.1)	59.9 (2.3)	60.7 (2.1)

Tissue distribution and biosynthesis of 1,2-saturated pyrrolizidine alkaloids in *Phalaenopsis* hybrids (Orchidaceae)

pp 1493–1502

Cordula Frölich, Thomas Hartmann, Dietrich Ober*

The tissue distribution of phalaenopsine in the orchid plant suggests chemoecological importance of the alkaloids. In rosette plants the aerial roots are the sites of alkaloid biosynthesis. Phalaenopsine does not underlie degradation or turnover but is translocated to other plant parts. The results are discussed in the context of molecular evolution of pyrrolizidine alkaloid biosynthesis in angiosperms and ecological function of 1,2-saturated pyrrolizidine alkaloids.



Phalaenopsine
(1,2-saturated pyrrolizidine alkaloid)

The phytoalexins from cauliflower, caulilexins A, B and C: Isolation, structure determination, syntheses and antifungal activity

pp 1503–1509

M. Soledade C. Pedras*, Mohammed G. Sarwar, Mojmir Suchy, Adewale M. Adio

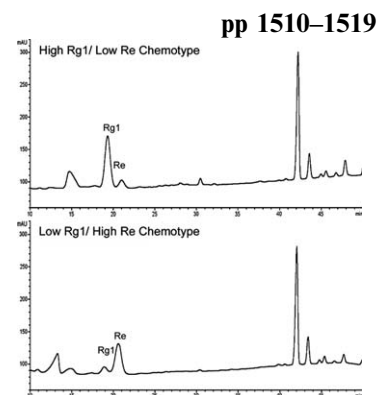
Investigation of phytoalexin production in cauliflower led to isolation of seven phytoalexins, three of which are new; syntheses and antifungal activities are reported.



Ginsenoside content and variation among and within American ginseng (*Panax quinquefolius* L.) populations

Erin M. Schlag, Marla S. McIntosh*

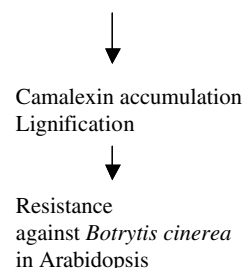
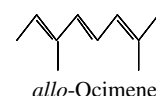
Ginsenoside contents were measured in American ginseng (*Panax quinquefolius*) roots from 10 Maryland populations. Variation among populations was highly significant for Rg1 and Re ginsenosides. Roots from six populations (wild and cultivated) exhibited a High Rg1/Low Re chemotype (top panel) distinct from the profile characteristic of American ginseng (bottom panel).



Analysis of defensive responses activated by volatile *allo*-ocimene treatment in *Arabidopsis thaliana*

Kyutaro Kishimoto, Kenji Matsui*, Rika Ozawa, Junji Takabayashi

allo-Ocimene treatment induced defensive responses, such as induction of defense genes, accumulation of lignin and camalexin, and resistance against *Botrytis cinerea* in *Arabidopsis*. The profiles to respond against *allo*-ocimene-treatment were largely similar to those against C6-aldehydes even though their structures are highly different each other.



pp 1520–1529

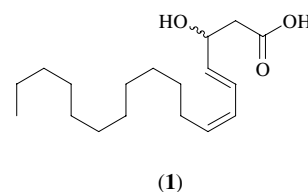
BIOACTIVE PRODUCTS

Antimicrobial constituents of *Scrophularia deserti*

pp 1530–1533

Michael Stavri, K.T. Mathew, Simon Gibbons*

Bioassay-guided isolation of a hexane extract of *Scrophularia deserti* (Scrophulariaceae) led to the characterisation of an antibacterial hydroxylated fatty acid **1**. Compound **1** was active against multidrug and methicillin-resistant *Staphylococcus aureus* (MRSA) and rapidly growing mycobacteria with MICs ranging from 32 to 128 µg/ml.

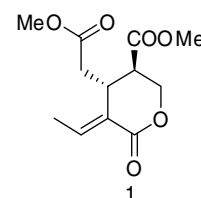


Modified secoiridoid from *Acicarpha tribuloides* and inhibition of nitric oxide production in LPS-activated macrophages

pp 1534–1538

Tamara L. Meragelman, Beatriz Salido Renteria, Gloria L. Silva*, Claudia Sotomayor, Roberto R. Gil*

The search for nitric oxide inhibitors from *Acicarpha tribuloides* Juss. resulted in the isolation of an uncommon non-glycosylated secoiridoid, tribulolide (**1**), as well as two natural chromones together with two known secoiridoid glycosides. The secoiridoids showed inhibition of NO production in lipopolysaccharide-activated macrophages with activity comparable to aminoguanidine, a classic inhibitor.

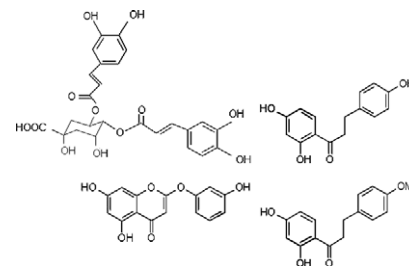


Bioassay-guided isolation of aldose reductase inhibitors from *Artemisia dracunculus*

pp 1539–1546

Sithes Logendra, David M. Ribnicky*, Hui Yang, Alexander Poulev, Jun Ma, Edward J. Kennelly, Ilya Raskin

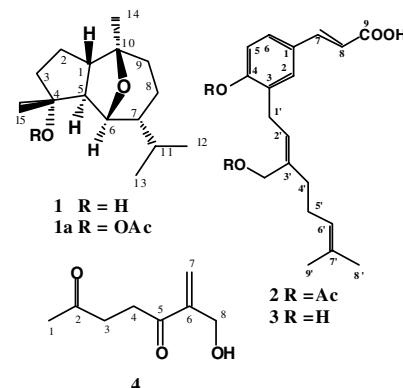
Four aldose reductase inhibitors were isolated from the ethanolic extract of the shoots of *Artemisia dracunculus*. These compounds were identified as 4,5-di-*O*-caffeoylquinic acid, davidigenin, 6-demethoxycapillarisin and 2',4'-dihydroxy-4-methoxydihydrochalcone.

**CHEMISTRY****Constituents of *Chrysothamnus viscidiflorus***

pp 1547–1553

Ahmed A. Ahmed*, Mohamed-Elamir F. Hegazy, Nahed M. Hassan, Malgorzata Wojcinska, Joe Karchesy, Paul W. Pare, Tom J. Mabry

The aerial parts of *Chrysothamnus viscidiflorus* var. *viscidiflorus* afforded three new and seven known compounds. Structures of compounds were determined by spectroscopic methods. Four compounds showed anti-cancer activity against human breast cancer cells.

**OTHER CONTENTS****Erratum**

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* Corresponding author

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