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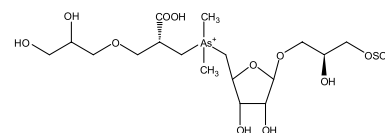
REVIEWS

Biologically active compounds of semi-metals

pp 585–606

Tomáš Řezanka*, Karel Sigler

The present state of knowledge in the chemistry of organic compounds of semi-metals from different organisms is reviewed. They include, e.g., the boron-containing antibiotics or the silicon compounds present in “silicate” bacteria. Arsenic is incorporated into arsenosugars, arsenobetaines or volatile methylated arsenic compounds, selenium is incorporated into selenocysteine that is found in some proteins. Other metalloids, i.e. the rare and toxic tellurium and the radioactive short-lived astatine, have no biological significance.

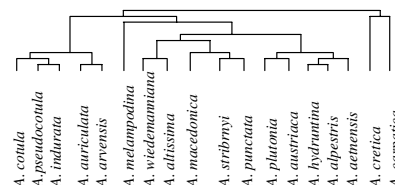


Sesquiterpene lactones as chemotaxonomic markers in genus *Anthemis*

pp 607–618

Jordanka D. Staneva*, Milka N. Todorova, Ljuba N. Evstatieva

A chemotaxonomic discussion on the basis of the lactone profile of 18 species from genus *Anthemis* is presented. *A. macedonica* is suggested to be transferred from sect. *Anthemis* to sect. *Hiorthia*.



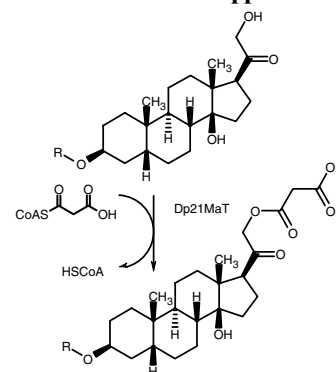
PROTEIN BIOCHEMISTRY

Purification and characterization of malonyl-coenzyme A: 21-hydroxypregnane 21-O-malonyltransferase (Dp21MaT) from leaves of *Digitalis purpurea* L.

pp 619–626

Serge Philibert Kuate, Rodrigo M. Pádua, Wilhelm F. Eisenbeiss, Wolfgang Kreis*

Malonyl-coenzyme A: 21-hydroxypregnane 21-O-malonyltransferase catalyzing the transfer of a malonyl moiety to the 21-hydroxy group of 21-hydroxypregnanes has been purified and characterized. This enzyme probably initiates butenolide ring formation in cardenolide biosynthesis.

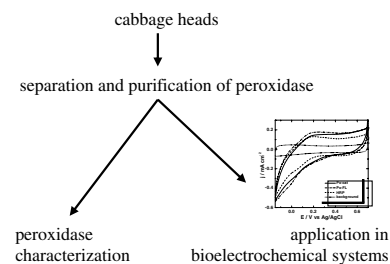


Spring cabbage peroxidases – Potential tool in biocatalysis and bioelectrocatalysis

pp 627–636

Anna Belcarz^{*}, Grazyna Ginalska, Barbara Kowalewska, Pawel Kulesza

Two peroxidase fractions were separated and partially purified from spring cabbage heads. Their characterization and potential practical application in bioelectrocatalytic systems for H₂O₂ reduction were described.

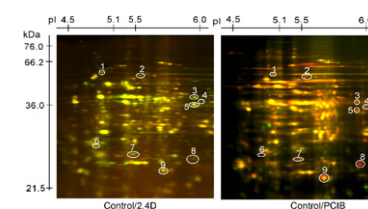


Quantitative analysis of auxin-regulated proteins from basal part of leaf sheaths in rice by two-dimensional difference gel electrophoresis

pp 637–646

Fang Shi, Hironori Takasaki, Setsuko Komatsu^{*}

To identify the effects of auxin on rice root formation, proteins induced by exogenous addition of auxin to rice seedlings were analyzed by a proteomic approach. Root formation by rice seedlings was promoted by 2,4-D and repressed by PCIB. Based on proteomic analyses, mitochondrial complex I subunit is part of the downstream signal cascade of PCIB, whereas myosin heavy chain, mitochondrial [Mn]SOD and EF-1β' are involved in the 2,4-D signal cascade but are probably upstream of PCIB.

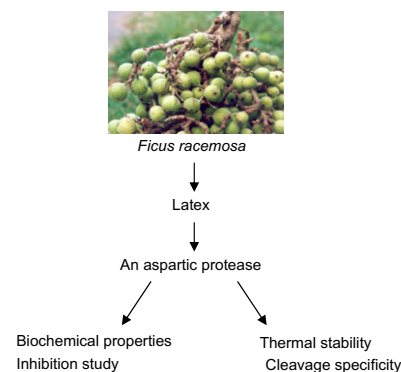


An unusual thermostable aspartic protease from the latex of *Ficus racemosa* (L.)

pp 647–655

K.B. Devaraj, Lalitha R. Gowda, V. Prakash^{*}

An aspartic protease has been purified from the latex of *Ficus racemosa* and characterized. The molecular mass, single isoform, pH optima and stability of the protease are unique and differ from other known ficins.

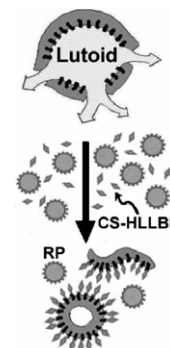


Hevea latex lectin binding protein in C-serum as an anti-latex coagulating factor and its role in a proposed new model for latex coagulation

pp 656–662

Rapepun Wititsuwannakul^{*}, Piyaporn Pasitkul, Pattavuth Jewtragoon, Dhirayos Wititsuwannakul

A protein specific for *Hevea* latex lectin binding was isolated and purified from C-serum of fresh latex. Its biochemical properties and physiological involvement in a new model for latex coagulation is presented.



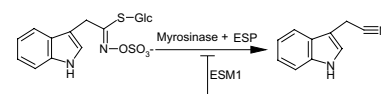
MOLECULAR GENETICS AND GENOMICS

ESP and ESM1 mediate indol-3-acetonitrile production from indol-3-ylmethyl glucosinolate in *Arabidopsis*

pp 663–671

Meike Burow, Zhi-Yong Zhang, James A. Ober, Virginia M. Lambrix, Ute Wittstock, Jonathan Gershenzon, Daniel J. Kliebenstein*

Multiple proteins function to control the production of indol-3-acetonitrile during indole glucosinolate activation/hydrolysis.



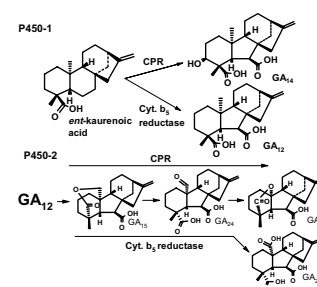
METABOLISM

Influence of electron transport proteins on the reactions catalyzed by *Fusarium fujikuroi* gibberellin monooxygenases

pp 672–683

Claudia Troncoso, José Cárcamo, Peter Hedden, Bettina Tudzynski, M. Cecilia Rojas*

Products formed by GA₁₄ synthase and gibberellin 20-oxidase in *Fusarium fujikuroi* mutants that lack cytochrome P450 reductase (CPR) are qualitatively and quantitatively different from those produced in CPR-containing strains. Interaction of these P450s with cyt b5:cyt b5 reductase in the mutants would account for the differences found.

**Lipid characterization of a wrinkled sunflower mutant**

pp 684–691

Mónica Venegas-Calcrón, Enrique Martínez-Force, Rafael Garcés*

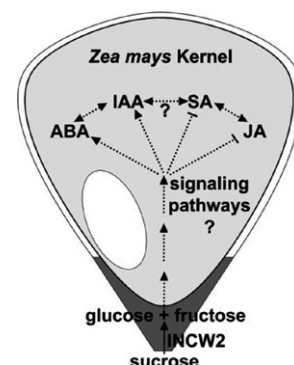
This mutant seed has a wrinkled phenotype, with reduced content of storage triacylglycerols, normal phospholipids contents and increase content of palmitic and deficient biosynthesis of linolenic acid during seed germination.

**Cell wall invertase-deficient *miniature1* kernels have altered phytohormone levels**

pp 692–699

Sherry LeClere*, Eric A. Schmelz, Prem S. Chourey

Kernels of the *Zea mays* cell wall invertase (INCW)-deficient *miniature1* seed mutant display dramatic decreases in indole-3-acetic acid (IAA) levels and alterations in salicylic acid (SA), jasmonic acid (JA) and abscisic acid (ABA) levels, indicating that alterations in INCW-mediated sucrose cleavage affect downstream hormone homeostasis.

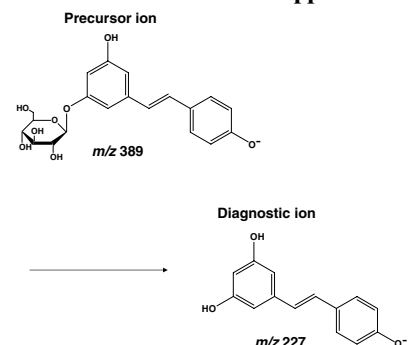


ECOLOGICAL BIOCHEMISTRY

Accumulation of *trans*-piceid in sorghum seedlings infected with *Colletotrichum sublineolum*

Christine K.Y. Yu, Chun-Hat Shih, Ivan K. Chu^{*}, Clive Lo^{*}

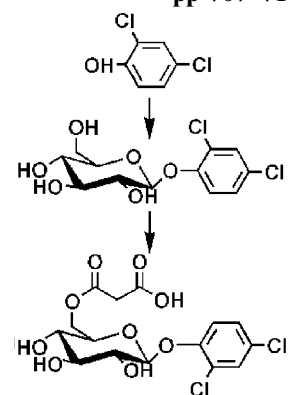
Using LC-MS in precursor ion scan mode, *trans*-piceid was identified as the major stilbene metabolite in sorghum seedlings infected with the anthracnose pathogen *Colletotrichum sublineolum*. However, *trans*-piceid alone may not be a significant defense component against this pathogen. This is the first report of stilbene accumulation in sorghum.



Detoxification of 2,4-dichlorophenol by the marine microalga *Tetraselmis marina*

Dimitris Petroutsos, Petros Katapodis, Martina Samiotaki, George Panayotou, Dimitris Kekos^{*}

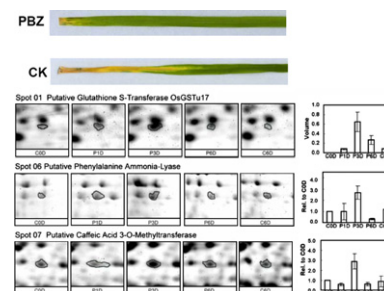
Xenobiotic chlorinated phenols have been found in fresh and marine waters and are toxic to many aquatic organisms. The marine microalga *Tetraselmis marina* has been found to tolerate and metabolize 2,4-dichlorophenol. The detoxification pathway has been elucidated.



Proteomic analysis of rice defense response induced by probenazole

Yu-Zu Lin, Huai-Yi Chen, Ruby Kao, Shih-Pai Chang, Su-Jein Chang, Erh-Min Lai^{*}

We report the first proteome of a rice defense response induced by a plant activator, PBZ. Eleven unique proteins from 9 PBZ-regulated spots were identified. We proposed that the identified PBZ-induced proteins PAL, COMT, and GSTU17 may confer PBZ-induced disease resistance via such functions as biosynthesis and transport of flavonoid-type phytoalexin and/or lignin biogenesis.

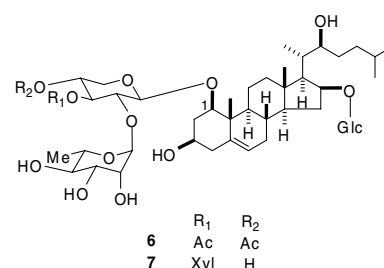


CHEMOTAXONOMY

Steroidal glycosides from the rhizomes of *Ruscus hypophyllum*

Yoshihiro Mimaki^{*}, Tsukasa Aoki, Maki Jitsuno, Ceyda Sibel Kiliç, Maksut Coşkun

Seven steroidal glycosides, along with one known glycoside, were isolated from the rhizomes of *Ruscus hypophyllum* (Liliaceae).

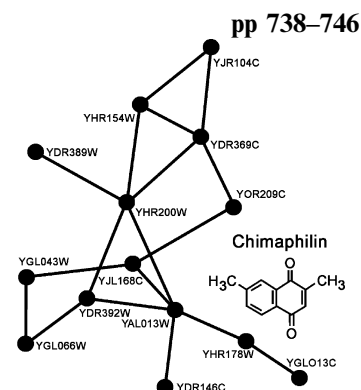


BIOACTIVE PRODUCTS

Antifungal and antioxidant activities of the phytomedicine pipsissewa, *Chimaphila umbellata*

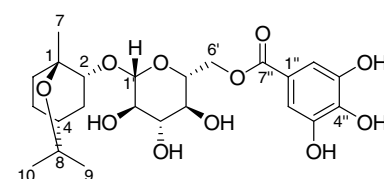
Imelda J. Galván, Nadereh Mir-Rashed, Matthew Jessulat, Monica Atanya, Ashkan Golshani, Tony Durst, Philippe Petit, Virginie Treyvaud Amiguet, Teun Boekhout, Richard Summerbell, Isabel Cruz, John T. Arnason, Myron L. Smith*

Demonstration of antifungal and antioxidant effects supports the traditional use of pipsissewa in treating skin ailments. Chemical-genetic profiling with a library of yeast deletion mutants indicated that the principal antifungal constituent, chimaphilin, had a complex mode of action, affecting a protein–protein interaction network including 26% of the genes in the profile.

Bioactive monoterpene glycosides conjugated with gallic acid from the leaves of *Eucalyptus globulus*

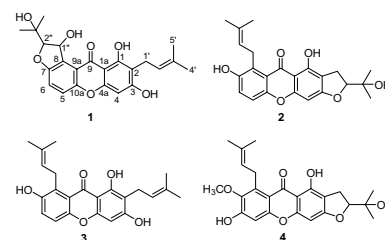
Tatsuya Hasegawa*, Fumihide Takano, Takanobu Takata, Masato Niiyama, Tomihisa Ohta*

Two monoterpene glycosides conjugated with gallic acid [globulisin A (1) and B (2)], together with four known compounds, were isolated from hot-water extracts of the leaves of *Eucalyptus globulus*. Globulisin A (1) and eucaglobulin (4) exhibited significant antioxidant, anti-inflammatory and anti-melanogenesis activity.

Xanthenes with quinone reductase-inducing activity from the fruits of *Garcinia mangostana* (Mangosteen)

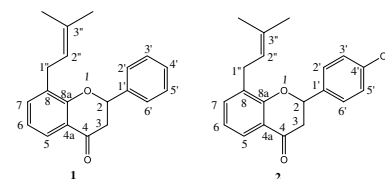
Young-Won Chin, Hyun-Ah Jung, Heebyung Chai, William J. Keller, A. Douglas Kinghorn*

Four quinone reductase-inducing xanthenes, including two xanthenes (1 and 2), were isolated from *Garcinia mangostana*.

Nematicidal prenylated flavanones from *Phyllanthus niruri*

N.A. Shakil*, Pankaj, J. Kumar, R.K. Pandey, D.B. Saxena

The hexane extract of *Phyllanthus niruri* plant, on rigorous column chromatography, yielded two prenylated flavanones, viz. 8-(3-methyl-but-2-enyl)-2-phenyl chroman-4-one (1) and 2-(4-hydroxyphenyl)-8-(3-methyl-but-2-enyl)-chroman-4-one (2). These were evaluated for nematicidal activity against two nematodes, i.e. root-knot (*Meloidogyne incognita*) and reniform (*Rotylenchulus reniformis*). The LC₅₀ values ranged between 3.3 to 14.5 ppm as compared to 3.1 ppm for standard carbofuran.

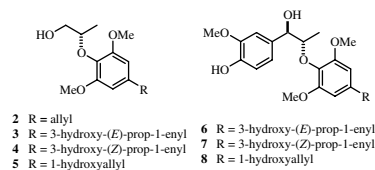


Biotransformation of myrislignan by rat liver microsomes *in vitro*

pp 765–771

Fei Li, Xiu-Wei Yang*

Myrislignan (**1**) is a major acyclic neolignan in seeds of *Myristica fragrans*. We investigated the biotransformation of myrislignan by rat liver microsomes *in vitro*. Seven metabolites were produced by rat liver microsomes from phenobarbital sodium-pretreated rats. As determined by spectroscopic methods, these were identified as myrislignanometins A–G (**2–8**).



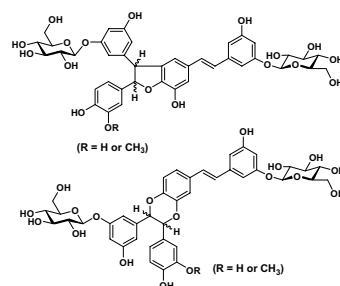
CHEMISTRY

Diastereomeric stilbene glucoside dimers from the bark of Norway spruce (*Picea abies*)

pp 772–782

Sheng-Hong Li, Xue-Mei Niu, Stefan Zahn, Jonathan Gershenzon*, Jennie Weston, Bernd Schneider*

Eight stilbene glucoside dimers containing either a dihydrofuran ring or a dihydro-1,4-dioxin moiety, designated as piceasides A–H, were isolated as four 1:1 mixtures of inseparable diastereomers. Their structures were determined by extensive spectroscopic means including 1D and 2D NMR spectra, and were supported by enzymatic hydrolysis and computational analysis.

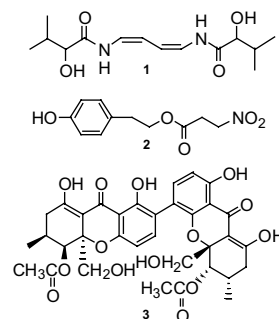


Metabolites from the endophytic fungus *Phomopsis* sp. PSU-D15

pp 783–787

Vatcharin Rukachaisirikul*, Ubonta Sommart, Souwalak Phongpaichit, Jariya Sakayaroj, Kanyawim Kirtikara

From the endophytic fungus *Phomopsis* sp. PSU-D15, three metabolites (**1–3**) were isolated together with three known compounds. Their structures were elucidated by spectroscopic methods and by comparison with the literature values. Compound **1** exhibited moderate *in vitro* antimycobacterial activity against *Mycobacterium tuberculosis* H37Ra with a MIC value of 6.25 µg/ml.

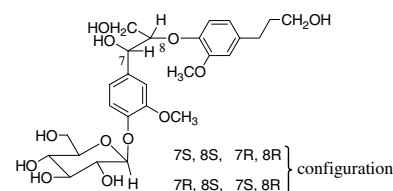


Neolignan glycosides from *Symplocos caudata*

pp 788–795

Changhong Huo, Hong Liang, Yuying Zhao, Bin Wang, Qingying Zhang*

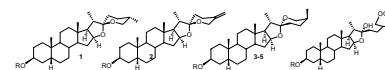
Four optical isomers of 7,9,9'-trihydroxy-3,3'-dimethoxy-8-*O*-4'-neolignan-4-*O*-β-D-glucopyranoside, a lignan lactone glycoside, and a phenylpropanoid glycoside were isolated from *Symplocos caudata*.



Steroidal saponins from the roots of *Asparagus racemosus***pp 796–804**

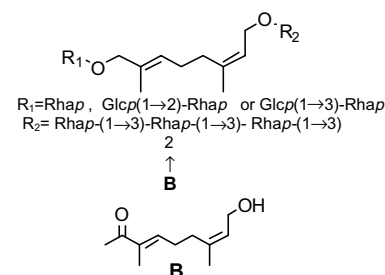
Patricia Y. Hayes, Aisyah H. Jahidin, Reg Lehmann, Kerry Penman,
William Kitching, James J. De Voss*

Five steroidal saponins (shatavarins VI–X) and five known saponins have been isolated from the roots of *Asparagus racemosus* by RP-HPLC and then characterized by spectroscopic methods (1D and 2D NMR experiments) and mass spectrometry.

**Monoterpene glycosides isolated from *Fadogia agrestis*****pp 805–811**

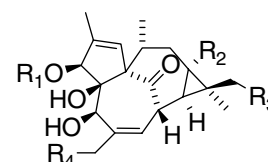
Regina Anero, Ana Díaz-Lanza*, Evelyne Ollivier, Béatrice Baghdikian,
Guy Balansard, Manuel Bernabé

We report the isolation and structural elucidation of six monoterpene glycosides from *Fadogia agrestis*, a shrub used in traditional african medicine. The compounds are all derivatives of 2,6-dimethyl-2(*E*),6(*Z*)-octadiene-1,8-diol. In addition, three of them contain the acyl group B. The glycosides are derivatives of rhamnose and glucose.

**Ingenane diterpenoids from *Euphorbia esula*****pp 812–819**

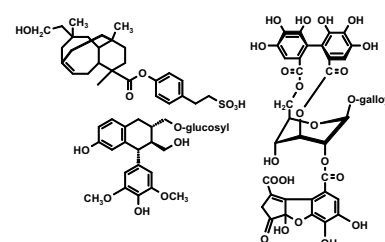
Zhi-Qiang Lu, Min Yang, Jin-Qiang Zhang, Guang-Tong Chen, Hui-Lian Huang,
Shu-Hong Guan, Chao Ma, Xuan Liu, De-An Guo*

Sixteen ingenane diterpenoids (**1–16**), together with five known compounds, were isolated from *Euphorbia esula*. Their structures were elucidated on the basis of spectroscopic studies and comparison with known related compounds. All the compounds were assayed for their inhibitory activity against human hela cervical cancer cell line.

**An ellagitannin, *n*-butyl gallate, two aryltetralin lignans, and an unprecedented diterpene ester from *Pelargonium reniforme*****pp 820–826**

Klaus Peter Latté, Maki Kaloga, Andreas Schäfer, Herbert Kolodziej*

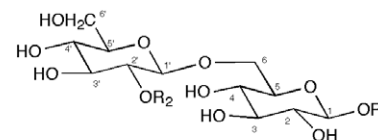
Four phenolic metabolites (pelargoniin E, *n*-butyl gallate, an aryltetralin lignan and, a unique diterpene ester, reniformin) together with five rarely reported compounds were isolated from *Pelargonium reniforme*.



Antioxidant phenylpropanoid glycosides from the leaves of *Wasabia japonica***pp 827–832**

Takahiro Hosoya, Young Sook Yun*, Akira Kunugi

From the MeOH extract of the leaves of *wasabia japonica*, seven phenylpropanoid glycosides (**1–7**) were isolated and determined based on spectroscopic data and chemical evidence along with eight known phenylpropanoids (**8–15**). The scavenging effect of compounds **1–15** on superoxide anion radicals was investigated using an electron spin resonance method.

**2.** R₁ = R₂ = *trans*-sinapoyl**OTHER CONTENTS****Announcement: The Phytochemical Society of Europe****pp I–II**

* Corresponding author

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