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Phytochemistry Vol. 70, No. 1, 2009

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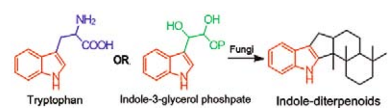
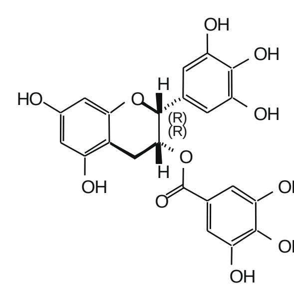
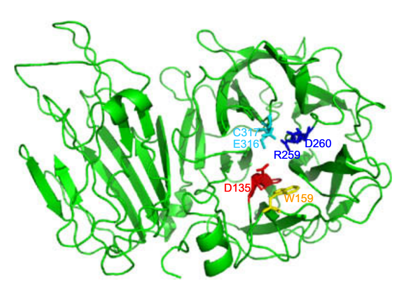




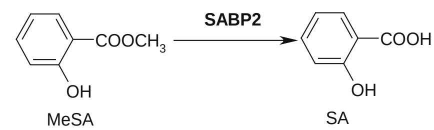


MOLECULAR GENETICS AND GENOMICS

Two poplar methyl salicylate esterases display comparable biochemical properties but divergent expression patterns **pp 32–39**

Nan Zhao, Ju Guan, Farhad Forouhar, Timothy J. Tschaplinski, Zong-Ming Cheng, Liang Tong, Feng Chen*

Two methyl salicylate (MeSA) esterase (SABP2) genes, *PtSABP2-1* and *PtSABP2-2*, were identified and cloned from poplar. The proteins encoded by *PtSABP2-1* and *PtSABP2-2* are 98% identical. Recombinant PtSABP2-1 and PtSABP2-2 displayed specific methyl esterase activity using MeSA as substrate to produce salicylic acid (SA). In addition to exhibiting comparable biochemical properties, PtSABP2-1 and PtSABP2-2 have conserved structural features. In contrast, *PtSABP2-1* and *PtSABP2-2* showed divergent expression patterns. The plausible evolutionary mechanisms leading to these two highly homologous MeSA esterase genes involved in divergent biological processes in poplar are discussed.

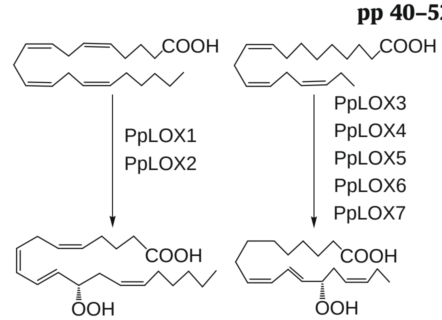


METABOLISM

***Physcomitrella patens* has lipoxygenases for both eicosanoid and octadecanoid pathways** **pp 40–52**

Aldwin Anterola*, Cornelia Göbel, Ellen Hornung, George Sellhorn, Ivo Feussner, Howard Grimes

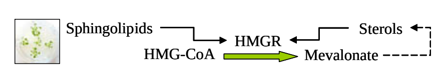
Two lipoxygenases from *Physcomitrella patens* use arachidonic acid preferentially as substrate to produce (12*S*)-HPETE, while five others preferentially use α-linolenic acid to produce (13*S*)-HPOTE.



Arabidopsis 3-hydroxy-3-methylglutaryl-CoA reductase is regulated at the post-translational level in response to alterations of the sphingolipid and the sterol biosynthetic pathways **pp 53–59**

Benjamín Nieto, Oriol Forés, Montserrat Arró, Albert Ferrer*

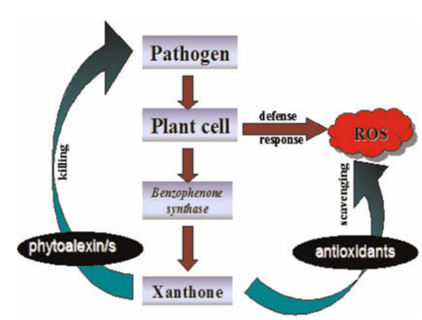
3-Hydroxy-3-methylglutaryl-CoA reductase (HMGR) catalyzes the major rate-limiting step in the mevalonate pathway for sterol biosynthesis. In this study we report that regulation of HMGR activity in response to alterations of the sphingolipid and the sterol biosynthetic pathways in *Arabidopsis thaliana* is exerted at the post-translational level.



Xanthone biosynthesis in *Hypericum perforatum* cells provides antioxidant and antimicrobial protection upon biotic stress **pp 60–68**

Gregory Franklin, Luis F.R. Conceição, Erich Kombrink, Alberto C.P. Dias*

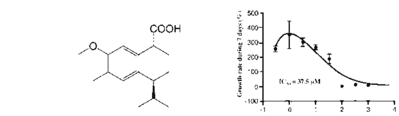
Xanthones are one of the most important classes of plant secondary metabolites commonly found in *Hypericum* and other Cluciaceae members. Here, we show that the coordinated functions of xanthones protect the plant cells from oxidative damage and help them to impair the pathogen growth upon biotic stress.



ECOLOGICAL BIOCHEMISTRY

Masanori Morimoto*, Charles L. Cantrell, Lynn Libous-Bailey, Stephen O. Duke

Borneol (**1**), phytotoxic calamenene-type sesquiterpenes (**2**–**5**, **9**–**11**) and methylated flavones (**12**–**15**) were isolated from the dichloromethane rinsate of camphorweed aerial tissues. The strongest plant growth inhibitor against *Agrostis stolonifera* and *Lactuca sativa* seedlings, as wells as duckweed (*Lemna pausicostata*), was 2-methoxy-calamenene-14-carboxylic acid (**2**).

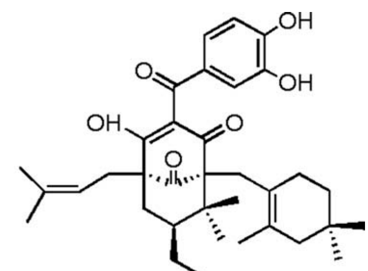


2-methoxycalamenene-14-carboxylic acid (2)

BIOACTIVE PRODUCTS

Guillaume Marti, Véronique Eparvier, Christian Moretti, Sophie Susplugas, Soizic Prado, Philippe Grellier, Pascal Retailleau, Françoise Guéritte, Marc Litaudon*

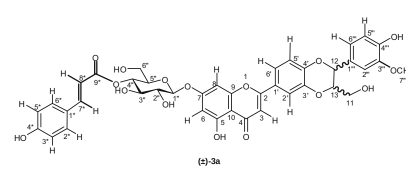
Phytochemical investigations of *Moronobea coccinea* (Clusiaceae) led to the isolation of 11 polycyclic polyprenylated acylphloroglucinol derivatives (**3**–**8**, **10**–**14**) along with garcinol, isogarcinol and cycloxanthochymol. *In vitro* antiplasmodial assays reveal potent antimalarial activity for eight of them.



14: coccinone H

Céline Rivière, Van Nguyen Thi Hong, Luc Pieters, Bieke Dejaegher, Yvan Vander Heyden, Minh Chau Van, Joëlle Quetin-Leclercq*

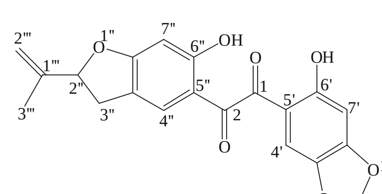
A phytochemical investigation of *Mallotus metcalfianus* Croizat afforded 16 compounds including two new flavones: luteolin-7-*O*-(4″-*O*-(*E*)-coumaroyl)-*β*-glucopyranoside) (**1**), chrysoeriol-7-*O*-(4″-*O*-(*E*)-coumaroyl)-*β*-glucopyranoside) (**2**) and a mixture of two pairs of diastereoisomeric flavonolignans, (±)-hydnocarpin 7-*O*-(4″-*O*-(*E*)-coumaroyl)-*β*-glucopyranoside) ((±)-**3a**)/(±)-hydnocarpin-D 7-*O*-(4″-*O*-(*E*)-coumaroyl)-*β*-glucopyranoside) ((±)-**3b**) with a 2:1 ratio.



(±)-3a

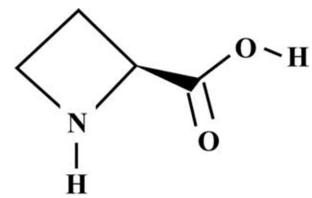
Seru Ganapaty*, Guttula Veera Kantha Srilakshmi, Steve Thomas Pannakal, Hafizur Rahman, Hartmut Laatsch, Reto Brun

A benzil, calophione A, 1-(6′-Hydroxy-1′,3′-benzodioxol-5′-yl)-2-(6″-hydroxy-2″-isopropenyl-2″,3″-dihydro-benzofuran-5″-yl)-ethane-1,2-dione (**1**) and three coumestan derivatives, tephcalostan B, C and D (**2**–**4**) were isolated from the roots of *Tephrosia calophylla*. Compounds (**1**–**4**) were evaluated for cytotoxicity against RAW (mouse macrophage cells) and HT-29 (colon cancer cells) cancer cell lines and antiprotozoal activity against various parasitic protozoa. Calophione A (**1**) exhibited significant cytotoxicity with IC_{50} of 5.00 (RAW) and 2.90 μM (HT-29), respectively.



Edward Rubenstein*, Theresa McLaughlin, Richard C. Winant, Agustin Sanchez, Michael Eckart, Karolina M. Krasinska, Allis Chien

Azetidine-2-carboxylic acid (Aze) **1** is a toxic and teratogenic non-protein amino acid found in roots of sugar beets and table beets. Aze **1** is misincorporated into proteins in place of proline **2** in numerous species, including human. Herein, we report the presence of Aze **1** in three sugar beet byproducts fed to livestock: shredded sugar beet pulp, pelleted sugar beet pulp, and sugar beet molasses.

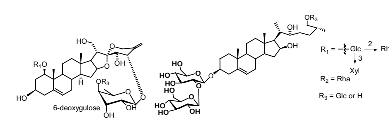


L-azetidine-2-carboxylic acid

CHEMISTRY

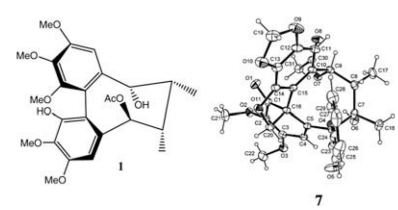
Patricia Y. Hayes, Reg Lehmann, Kerry Penman, William Kitching, James J. De Voss*

Eleven steroidal saponins including three saponins, two ecdysteroids and one fatty acid, have been isolated from the roots of *Trillium erectum* by RP-HPLC and characterized by spectroscopic (1D and 2D NMR) and spectrometric (LCMS) methods.



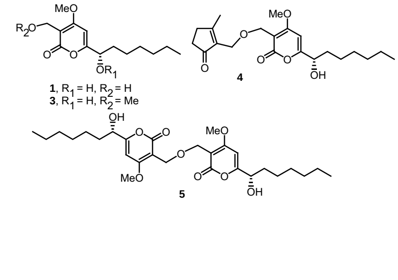
Ya-Ching Shen*, Yu-Chi Lin, Yuan-Bin Cheng, Michael Y. Chiang, Shorong-Shii Liou, Ashraf Taha Khalil

Dibenzocyclooctadiene lignans, kadsuphilols I–M, were isolated from aerial parts of *Kadsura philippinensis* (Schisandraceae).



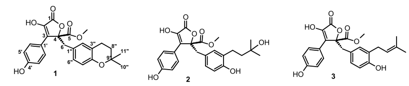
Porntep Chomcheon, Suthep Wiyakrutta, Nongluksna Sriubolmas, Nattaya Ngamrojanavanich, Chulabhorn Mahidol, Somsak Ruchirawat, Prasat Kittakoop*

Dothideopyrones A–D (**1**, **3**, **4**, and **5**), together with seven known compounds were isolated from the endophytic mitosporic Dothideomycete sp., and *cis*, *trans*-muconic acid was isolated as a natural product for the first time.



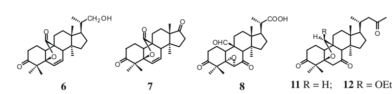
Rajesh R. Parvatkar*, Celina D'Souza, Ashootosh Tripathi, Chandrakant G. Naik

Two derivatives, Aspernolides A (**1**) and B (**2**) of a well known CDK inhibitor, butyrolactone I (**3**) were isolated from the culture medium of a marine derived fungus *Aspergillus terreus*.



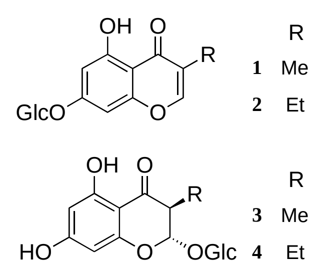
Jian-Chao Chen, Wu-Qing Liu, Lu Lu, Ming-Hua Qiu*, Yong-Tang Zheng, Liu-Meng Yang, Xian-Min Zhang, Lin Zhou, Zhong-Rong Li

Fourteen cucurbitane derivatives, including two pentanorcucurbitacins, one octanorcucurbitacin, and two trinorcucurbitacins, were isolated from the vines and leaves of *Momordica charantia*.



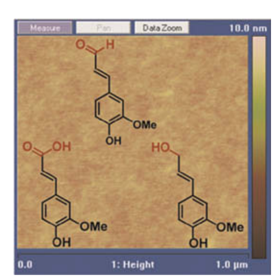
Naonobu Tanaka, Yoshiki Kashiwada, Tatsuro Nakano, Hirofumi Shibata, Tomihiko Higuchi, Michiko Sekiya, Yasumasa Ikeshiro, Yoshihisa Takaishi*

Chromone glucosides, takanechromones A–C (**1**, **2** and **5**) and chromanone glucosides, takanechromanones A and B (**3** and **4**) were isolated from the methanolic extracts of *Hypericum shikokumontanum* together with 27 known compounds. Their structures were established based on spectroscopic evidence. The isolated compounds and some chromone derivatives were assayed for antimicrobial activity against *Helicobacter pylori* and cytotoxicity against human cancer cell lines. Anti-*H. pylori* activity was observed in 5,7-dihydroxy-3-methylchromone (**6**) and 3-ethyl-5-methoxy-7-hydroxychromone (**7a**), while **6** and 5,7-dihydroxy-3-ethylchromone (**7**) showed cytotoxicities against multi-drug resistant cancer cell lines comparable to those of doxorubicin.



Anders Holmgren, Magnus Norgren, Liming Zhang, Gunnar Henriksson*

Dehydrogenation polymers were generated through enzymatic oxidation of ferulic acid, coniferaldehyde and coniferyl alcohol, respectively. Chemical and physical properties of the materials were determined in order to discuss why plants prefer the alcohol for lignin biosynthesis and not the acid and aldehyde, which are biologically cheaper to produce.



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* Corresponding author

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