

Contents

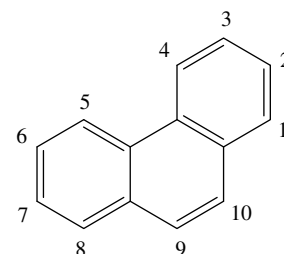
REVIEW

Natural phenanthrenes and their biological activity

pp 1084–1110

Adriána Kovács, Andrea Vasas, Judit Hohmann*

This contribution reviews some of the general aspects of the phenanthrenes, including their chemical categories, plant sources and biological activities. The review covers the major works presented in the literature up to the end of June 2007, relating to 120 references and 252 compounds.



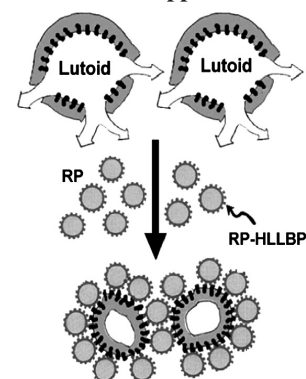
PROTEIN BIOCHEMISTRY

A rubber particle protein specific for *Hevea* latex lectin binding involved in latex coagulation

pp 1111–1118

Rapepun Wititsuwannakul*, Kamonchanok Rukseree, Kamonwan Kanokwiroon, Dhirayos Wititsuwannakul

A protein specific for binding to *Hevea* latex lectin was isolated and purified from fresh latex rubber particles. Its biochemical properties and involvement in rubber latex coagulation is reported.



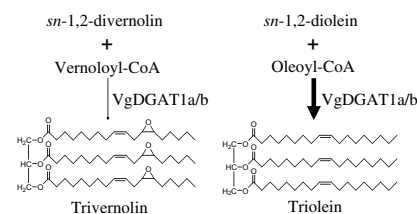
MOLECULAR GENETICS AND GENOMICS

Cloning and functional analysis of two type 1 diacylglycerol acyltransferases from *Vernonia galamensis*

pp 1119–1127

Keshun Yu, Runzhi Li, Tomoko Hatanaka, David Hildebrand*

Two *DGAT1* cDNAs from a high vernolic acid accumulator *Vernonia galamensis* were isolated. Expression study in yeast suggests that they are not responsible for the selective accumulation of vernolic acid in *V. galamensis*.

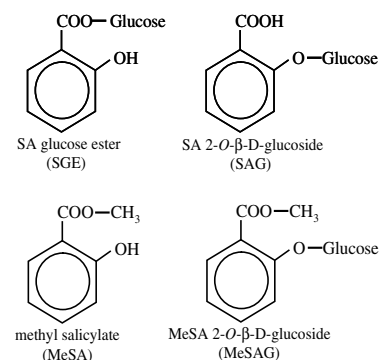


Overexpression of AtSGT1, an Arabidopsis salicylic acid glucosyltransferase, leads to increased susceptibility to *Pseudomonas syringae*

pp 1128–1134

Jong Tae Song*, Yeon Jong Koo, Hak Soo Seo, Min Chul Kim, Yang Do Choi, Jeong Hoe Kim

A portion of SA applied exogenously or produced endogenously during a defense response is metabolized to conjugated forms mainly because of the presence of glucosylation and methylation activities in the cell.



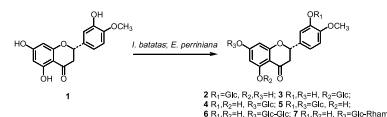
METABOLISM

Glycosylation of hesperetin by plant cell cultures

pp 1135–1140

Kei Shimoda, Hatsuyuki Hamada, Hiroki Hamada*

Three biotransformation products **2**, **5**, and **6** together with **3**, **4**, and **7** were isolated from cultured suspension cells of *Ipomoea batatas* and *Eucalyptus perriniana* treated with hesperetin (**1**).



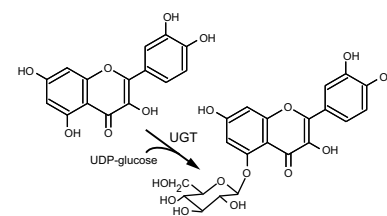
ECOLOGICAL BIOCHEMISTRY

Regioselective formation of quercetin 5-O-glucoside from orally administered quercetin in the silkworm, *Bombyx mori*

pp 1141–1149

Chikara Hirayama*, Hiroshi Ono, Yasumori Tamura, Kotaro Konno, Masatoshi Nakamura

Larvae of *Bombyx mori* absorb quercetin from their food and metabolize it to quercetin 5-O-glucosides, which are rare in plants. The first step of in the quercetin metabolism is catalyzed by a UDP-glucosyl transferase (UGT) with a regioselectivity for the C-5 position of quercetin in the midgut tissue.

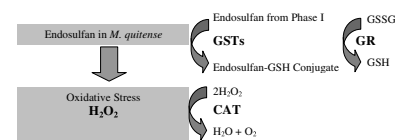


Endosulfan induces oxidative stress and changes on detoxication enzymes in the aquatic macrophyte *Myriophyllum quitense*

pp 1150–1157

Mirta L. Menone*, Silvia F. Pesce, María P. Díaz, Víctor J. Moreno, Daniel A. Wunderlin

Myriophyllum quitense, when exposed to environmentally relevant concentrations of endosulfan (**1**), showed a generalized induction of both detoxication and antioxidant enzyme (glutathione-S-transferase, glutathione reductase, catalase) activities, as well as an increased content of hydrogen peroxide, indicating that this xenobiotic activates the protection system of the plant, increasing its capacity to scavenge reactive oxygen species.



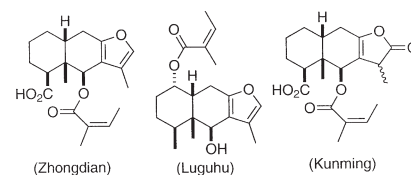
CHEMOTAXONOMY

Chemical and genetic diversity of *Ligularia vellerea* in Yunnan, China

pp 1158–1165

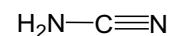
Motoo Tori*, Hiromi Nakamizo, Kanako Mihara, Masahiko Sato, Yasuko Okamoto, Katsuyuki Nakashima, Masami Tanaka, Yoshinori Saito, Masakazu Sono, Xun Gong*, Yuemao Shen, Ryo Hanai*, Chiaki Kuroda*

L. vellerea of Zhongdian, Luguahu, and Kunming areas in Yunnan Province of China could be distinguished on the basis of chemical constituents and DNA sequences.

Limited distribution of natural cyanamide in higher plants: Occurrence in *Vicia villosa* subsp. *varia*, *V. cracca*, and *Robinia pseudo-acacia*

pp 1166–1172

Tsunashi Kamo*, Mai Endo, Masae Sato, Ryohei Kasahara, Hiroko Yamaya, Syuntaro Hiradate, Yoshiharu Fujii, Nobuhiro Hirai, Mitsuru Hirota



Cyanamide has recently been proven to be a natural product. We have investigated 553 species of higher plants to date but have so far found the ability to biosynthesize cyanamide in only three species, *Vicia villosa* subsp. *varia*, *V. cracca* and *Robinia pseudo-acacia*, suggesting its limited distribution in higher plants.

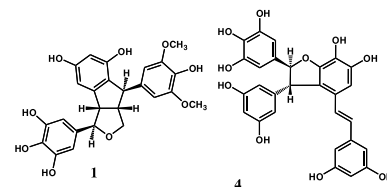
BIOACTIVE PRODUCTS

 α -Glucosidase inhibitors from the seeds of *Syagrus romanzoffiana*

pp 1173–1178

Sio-Hong Lam, Jhong-Min Chen, Chao-Jou Kang, Chung-Hsiung Chen, Shoei-Sheng Lee*

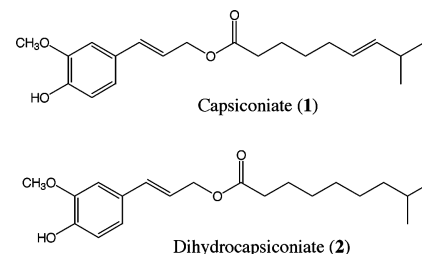
Bioassay-guided fractionation and separation of the EtOH extract of the seeds of *Syagrus romanzoffiana* against α -glucosidase resulted in the isolation of stilbenoids, 13-hydroxykompassinol A (**1**) and scirpusin C (**4**).

Isolation of coniferyl esters from *Capsicum baccatum* L., and their enzymatic preparation and agonist activity for TRPV1

pp 1179–1184

Kenji Kobata, Hitomi Tate, Yusaku Iwasaki, Yoshiyuki Tanaka, Keigo Ohtsu, Susumu Yazawa, Tatsuo Watanabe*

Coniferyl esters—capsiconiate (**1**) and dihydrocapsiconiate (**2**)—were isolated from the fruits of the pepper, *Capsicum baccatum* L. var. *praetermissum*. The agonist activity of **1** and **2** for transient receptor potential vanilloid 1 (TRPV1) expressed in HEK293 cells was $\text{EC}_{50} = 3.2 \mu\text{M}$ and $4.2 \mu\text{M}$, respectively.

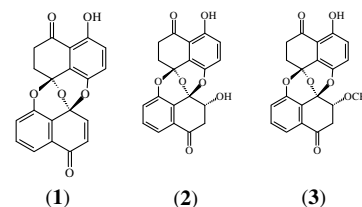


Naphthoquinone spiroketal with allelochemical activity from the newly discovered endophytic fungus *Edenia gomezpompae*

pp 1185–1196

Martha L. Macías-Rubalcava, Blanca E. Hernández-Bautista, Manuel Jiménez-Estrada, María C. González, Anthony E. Glenn, Richard T. Hanlin, Simón Hernández-Ortega, Aurora Saucedo-García, Jordi M. Muria-González, Ana Luisa Anaya*

Bioactivity-directed fractionation of the culture of the Ascomycota fungus *Edenia gomezpompae* led to the characterization of three bioactive naphthoquinone spiroketals: preussomerin EG₁ (1), preussomerin EG₂ (2) and preussomerin EG₃ (3). All compounds caused significant inhibition of the diameter growth of four phytopathogenic microorganisms. Compound 1 and acetylated derivatives also significantly inhibited the diameter growth of other endophytic fungi.



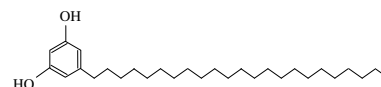
CHEMISTRY

Very long chain alkylresorcinols accumulate in the intracuticular wax of rye (*Secale cereale* L.) leaves near the tissue surface

pp 1197–1207

Xiufeng Ji, Reinhard Jetter*

In the cuticular wax of *Secale cereale* leaves, homologous series of very long chain 5-alkylresorcinols were identified by GC–MS and comparison with synthetic standard. The phenolics were found in the wax mixtures from the adaxial and the abaxial sides of the leaves. They were restricted to the intracuticular compartment and were lacking from the epicuticular wax layer.

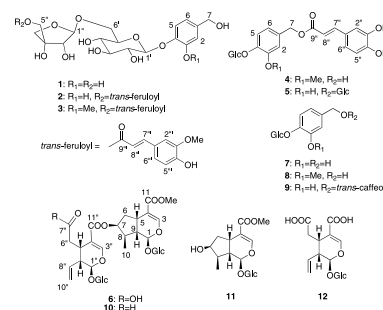


Phenolic and iridoid glycosides from *Strychnos axillaris*

pp 1208–1214

Atsuko Itoh, Yasuhiro Tanaka, Naotaka Nagakura, Toru Akita, Toyoyuki Nishi, Takao Tanahashi*

Five phenolic glycosides 1–5 and an iridoid glucoside 6 were isolated, together with 22 known compounds, from the dried barks and woods of *Strychnos axillaris*. The structures of the compounds were determined by spectroscopic and chemical means.

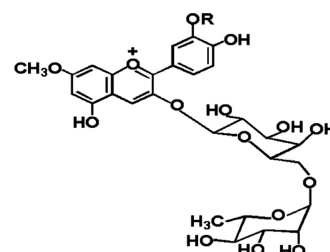


7-O-Methylated anthocyanidin glycosides from *Catharanthus roseus*

pp 1215–1219

Kenjiro Toki, Norio Saito, Yuki Irie, Fumi Tatsuzawa*, Atsushi Shigihara, Toshio Honda

Two anthocyanins were isolated from the orange-red flowers of *Catharanthus roseus* cv 'Equator Deep Apricot' as major anthocyanins, and identified to be rosinidin 3-O-[6-O-(α-rhamnopyranosyl)-β-galactopyranoside], and also 7-O-methylcyanidin 3-O-[6-O-(α-rhamnopyranosyl)-β-galactopyranoside] by chemical and spectroscopic methods.



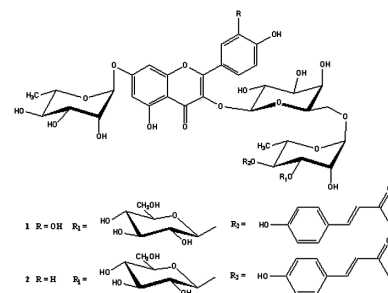
7-O-methylcyanidin 3-O-[6-O-(α-rhamnopyranosyl)-β-D-galactopyranoside] (R=H), rosinidin 3-O-[6-O-(α-rhamnopyranosyl)-β-D-galactopyranoside] (R=CH₃).

Flavonoid characterization and *in vitro* antioxidant activity of *Aconitum anthora* L. (Ranunculaceae)

pp 1220–1226

Cristina Mariani, Alessandra Braca, Sara Vitalini, Nunziatina De Tommasi, Francesco Visioli, Gelsomina Fico*

Chemical investigation on aerial parts of *Aconitum anthora* yielded quercetin 3-*O*-((β -D-glucopyranosyl-(1 \rightarrow 3)-(4-*O*-(*E*-*p*-coumaroyl))- α -L-rhamnopyranosyl-(1 \rightarrow 6)- β -D-galactopyranoside))-7-*O*- α -L-rhamnopyranoside (**1**) and kaempferol 3-*O*-((β -D-glucopyranosyl-(1 \rightarrow 3)-(4-*O*-(*E*-*p*-coumaroyl))- α -L-rhamnopyranosyl-(1 \rightarrow 6)- β -D-galactopyranoside))-7-*O*- α -L-rhamnopyranoside (**2**), together with other two known flavonols. For each compound the antioxidant activity was evaluated.

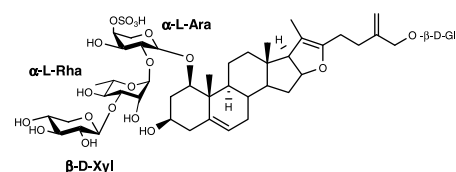


Steroidal glycosides from the underground parts of *Helleborus caucasicus*

pp 1227–1233

Carla Bassarello, Tamara Muzashvili, Alexandre Skhirtladze, Ether Kemertelidze, Cosimo Pizza, Sonia Piacente*

Four polyhydroxylated and polyunsaturated furostanol glycosides, named caucasicosides A–D, have been isolated from the MeOH extract of the underground parts of *Helleborus caucasicus*. Elucidation of their structures was carried out by 2D NMR spectroscopy in combination with ESI-MS and HR-ESI-MS analyses.

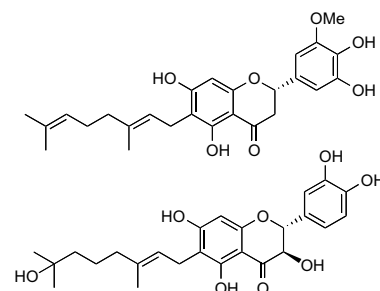


Geranylated flavanones from the secretion on the surface of the immature fruits of *Paulownia tomentosa*

pp 1234–1241

Teigo Asai, Noriyuki Hara, Sawa Kobayashi, Shiro Kohshima, Yoshinori Fujimoto*

The viscous secretion on the surface of the immature fruits of *Paulownia tomentosa* yielded nine flavanones substituted with either a geranyl group, its oxidized forms, or a prenyl group at the C-6 position, along with six known flavanones. Some of these compounds showed more potent anti-oxidant activity than tocopherol towards DPPH radicals.

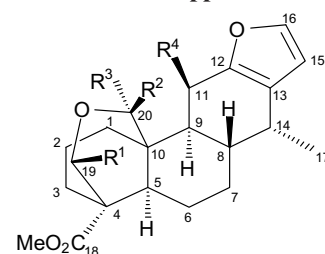


Phanginin A–K, diterpenoids from the seeds of *Caesalpinia sappan* Linn.

pp 1242–1249

Orapun Yodsaoue, Sarot Cheenpracha, Chatchanok Karalai*, Chanita Ponglimanont, Suchada Chantrapromma, Hoong-Kun Fun, Akkharawit Kanjana-Opas

Eleven cassane-type diterpenes, named phanginin A–K (**1**–**11**), were isolated from the seeds of *Caesalpinia sappan* Linn. The structure of **1** was confirmed by X-ray diffraction technique.



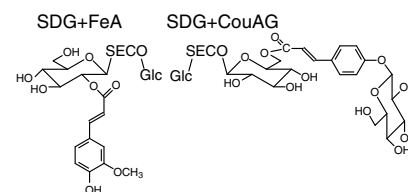
- 1: $R^1 = R^3 = R^4 = H$, $R^2 = OH$
 2: $R^1 = OH$, $R^2 = R^3 = R^4 = H$
 3: $R^1 = R^2 = R^4 = H$, $R^3 = OMe$

Hydroxycinnamic acids are ester-linked directly to glucosyl moieties within the lignan macromolecule from flaxseed hulls

pp 1250–1260

Karin Struijs, Jean-Paul Vincken, René Verhoef, Alphons G.J. Voragen, Harry Gruppen*

Secoisolariciresinol diglucoside (SDG), ester-linked to hydroxy-methyl-glutaric acid, forms the backbone of the lignan macromolecule. Coumaric acid glucoside (CouAG) and ferulic acid (FeA) link directly to the C-6 and C-2 position, respectively, of a glucosyl moiety of SDG. Ferulic acid glucoside is ester-linked to the macromolecule via its carboxyl group.

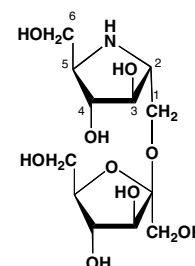


Iminosugars from *Baphia nitida* Lodd.

pp 1261–1265

Atsushi Kato*, Noriko Kato, Saori Miyauchi, Yuka Minoshima, Isao Adachi, Kyoko Ikeda, Naoki Asano, Alison A. Watson, Robert J. Nash

An 1-*O*-β-*D*-fructofuranoside of 2*R*,5*R*-dihydroxymethyl-3,4-dihydropyrrolidine was isolated from the leaves of *Baphia nitida*, together with six known iminosugars and three iminosugar glucosides.

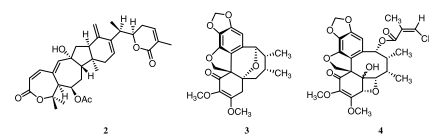


Compounds from *Kadsura heteroclita* and related anti-HIV activity

pp 1266–1272

Jian-Xin Pu, Liu-Meng Yang, Wei-Lie Xiao, Rong-Tao Li, Chun Lei, Xue-Mei Gao, Sheng-Xiong Huang, Sheng-Hong Li, Yong-Tang Zheng, Hao Huang, Han-Dong Sun*

Phytochemical investigation of the stems of *Kadsura heteroclita* led to the isolation of 16 compounds, including the triterpenoid, named longipedlactone J (2), and the dibenzocyclooctadiene type lignans, named heteroclitin I and J (3, 4). Compounds 6 and 12 exhibited moderate anti-HIV activity with EC₅₀ values of 1.6 μg/mL, and 1.4 μg/mL, therapeutic index (TI) values of 52.9, and 65.9, respectively.

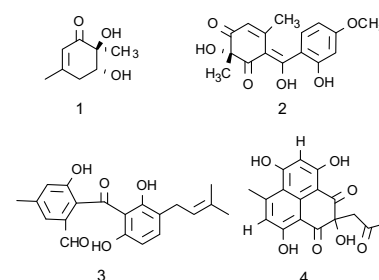


Polyketides from *Penicillium* sp. JP-1, an endophytic fungus associated with the mangrove plant *Aegiceras corniculatum*

pp 1273–1278

Zhenjian Lin, Tianjiao Zhu, Yuchun Fang, Qianqun Gu*, Weiming Zhu*

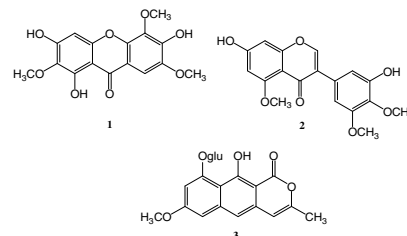
Polyketides, leptosphaerone C (1), penicillenone (2), arugosin I (3) and 9-demethyl FR-901235 (4), were produced by the endophytic fungus *Penicillium* sp. Compounds 1 and 2 showed cytotoxicity against A-549 and P388 cells, respectively.



Antibacterial phenolic components from *Eriocaulon buergerianum***pp 1279–1286**

Jing-Jing Fang, Guan Ye*, Wen-Liang Chen, Wei-Min Zhao*

Twenty-four plant phenols were isolated and identified from *Eriocaulon buergerianum*, of which 19 were previously known. Ten of these phenolics were found to exhibit antibacterial activity against *Staphylococcus aureus* (ATCC 25923).

**OTHER CONTENTS****Book reviews****pp 1287–1288****Announcement: The Phytochemical Society of Europe****pp I–II**

* Corresponding author

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