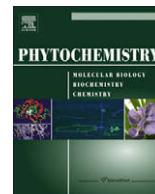




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Phytochemistry Vol. 69, No. 18, 2008

Special issue Tannin/Polyphenol Special Issue

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EDITORIAL

Tannins and related polyphenols: Perspectives on their chemistry, biology, ecological effects, and human health protection

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OBITUARY

William Edwin (Ted) Hillis (1921–2008): A Pioneer in the Study of (Heart)wood Formation and their Constituents

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Rosemary Hillis, Norman G. Lewis, Yoshi Yazaki

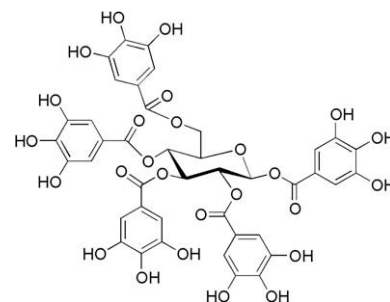
BIOSYNTHESIS

From lignins to tannins: Forty years of enzyme studies on the biosynthesis of phenolic compounds

pp 3018–3031

Georg G. Gross*

In the early 1960s, enzyme studies began to replace previously prevalent 'feeding' experiments with labeled tracers to elucidate metabolic pathways in higher plants. This insights, particularly on the role of 'energy-rich' intermediates, were obtained by this advanced technique. Based on the author's own experience, principal findings and trends over the past 40+ years in the enzymology of plant phenolics (lignins, acyl amides and hydrolyzable tannins) are reported.

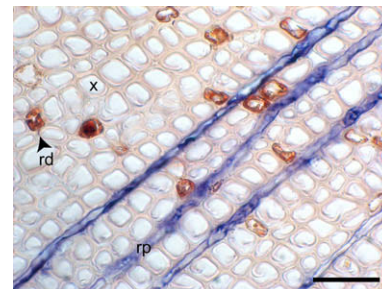


Relationship of dirigent protein and 18s RNA transcript localization to heartwood formation in western red cedar

pp 3032–3037

Ann M. Patten, Laurence B. Davin, Norman G. Lewis*

An *in situ* mRNA hybridization approach enabled detection of dirigent protein transcripts in cork cambia, vascular cambia and ray parenchyma cells of the sapwood of western red cedar (*Thuja plicata*); 18s RNA transcript localization was also observed in heartwood parenchyma cells.

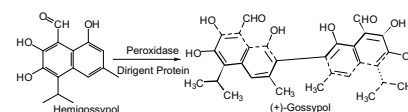


Stereoselective coupling of hemigossypol to form (+)-gossypol in moco cotton is mediated by a dirigent protein

pp 3038–3042

Jinggao Liu*, Robert D. Stipanovic, Alois A. Bell, Lorraine S. Puckhaber, Clint W. Magill

A dirigent protein has been identified and partially purified from moco cotton flower petal tissue. This dirigent protein guided stereoselective coupling of hemigossypol free radicals generated by peroxidase for the preferential formation of (+)-gossypol in moco cotton.

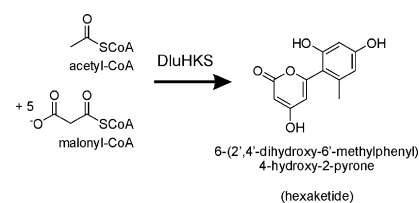


Pyrone polyketides synthesized by a type III polyketide synthase from *Drosophyllum lusitanicum*

pp 3043–3053

Aphacha Jindaprasert, Karin Springob*, Jürgen Schmidt, Wanchai De-Eknamkul, Toni M. Kutchan

A polyketide synthase cDNA was isolated from callus cultures of *Drosophyllum lusitanicum* Link. The corresponding recombinant enzyme DluHKS accepted acetyl-CoA as starter substrate and carried out sequential decarboxylative condensations with a malonyl-CoA extender unit. The main product was identified as the hexaketide 6-(2',4'-dihydroxy-6'-methylphenyl)-4-hydroxy-2-pyrone. In addition, α -pyrones derived from three to five acetate units were detected.



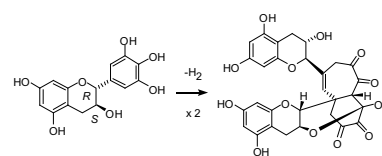
CHEMISTRY

Enzymatic oxidation of gallo catechin and epigallo catechin: Effects of C-ring configuration on the reaction products

pp 3054–3061

Yosuke Matsuo, Yuko Yamada, Takashi Tanaka*, Isao Kouno

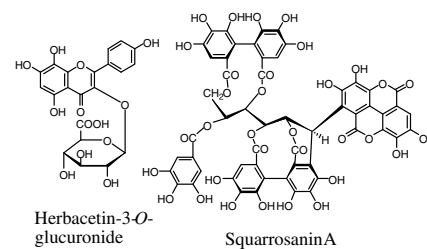
Enzymatic oxidation of (+)-gallo catechin yielded the proepitheasins-type dimer as the major product, though oxidation of (–)-epigallo catechin gave dehydrotheasins-type products predominantly.



Flavonol glucuronides and C-glucosidic ellagitannins from *Melaleuca squarrosa***pp 3062–3069**

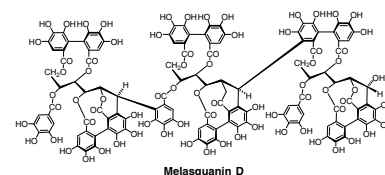
Morio Yoshimura, Hideyuki Ito, Kyoko Miyashita, Tsutomu Hatano, Shoko Taniguchi, Yoshiaki Amakura, Takashi Yoshida*

Two flavonol glucuronides and three ellagitannins, squarrosanins A–C, were isolated from the leaves of *Melaleuca squarrosa*, and their structures were elucidated based on analysis of spectroscopic data.

**C-Glucosidic ellagitannin oligomers from *Melaleuca squarrosa* Donn ex Sm., Myrtaceae****pp 3070–3079**

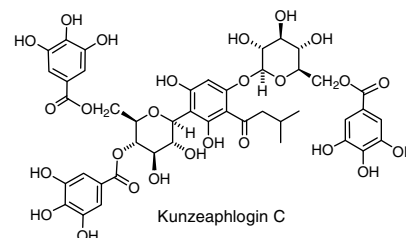
Takashi Yoshida*, Hideyuki Ito, Morio Yoshimura, Kyoko Miyashita, Tsutomu Hatano

C-glucosidic ellagitannins, melasquanins A–D were isolated from *Melaleuca squarrosa* and their oligomeric structures were elucidated based on spectroscopic data.

**Phloroglucinol diglycosides accompanying hydrolyzable tannins from *Kunzea ambigua*****pp 3080–3086**

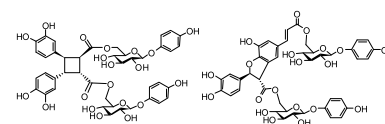
Naoki Kasajima, Hideyuki Ito*, Tsutomu Hatano*, Takashi Yoshida

Six phloroglucinol glycosides, kunzeaphlogins A–F and a dimeric hydrolyzable tannin, kunzeatannin A, were isolated from *Kunzea ambigua*. Their structures were determined on the basis of spectroscopic and chemical evidence.

**Caffeoyl arbutin and related compounds from the buds of *Vaccinium dunalianum*****pp 3087–3094**

Ping Zhao, Takashi Tanaka*, Keisuke Hirabayashi, Ying-Jun Zhang, Chong-Ren Yang, Isao Kouno*

Dunalianosides A–I, esters of arbutin and related phenolic glucosides, were isolated from the buds of *Vaccinium dunalianum* Wight (Ericaceae) together with 20 known compounds.

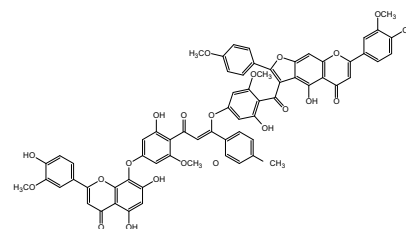


Tetraflavonoid and biflavonoids from *Aristolochia ridicula*

pp 3095–3102

Marcos B. Machado, Lucia M.X. Lopes*

Biflavones, a chalcone–flavone, and a tetraflavonoid with a new carbon skeleton were isolated from the leaves of *Aristolochia ridicula*. Their structures were determined by chemical derivatizations and spectrometric analyses.



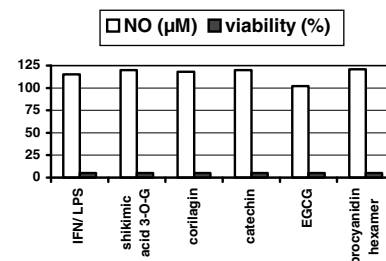
PHARMACOLOGICAL PROPERTIES AND HEALTH EFFECTS OF POLYPHENOLS

Stimulus (polyphenol, IFN- γ , LPS)-dependent nitric oxide production and antileishmanial effects in RAW 264.7 macrophages

pp 3103–3110

Herbert Kolodziej*, Oliver A. Radtke, Albrecht F. Kiderlen

The effects of IFN- γ , LPS and some polyphenols as individual stimuli as well as in various combinations on the NO production in non-infected and infected macrophage-like RAW 264.7 cells were investigated, with emphasis on the NO/parasite kill relationship.

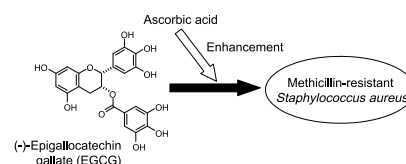


Enhancement of antibacterial effects of epigallocatechin gallate, using ascorbic acid

pp 3111–3116

Tutomu Hatano*, Mayumi Tsugawa, Miwako Kusuda, Shoko Taniguchi, Takashi Yoshida, Sumiko Shiota, Tomofusa Tsuchiya

Antibacterial effect of epigallocatechin gallate on methicillin-resistant *Staphylococcus aureus* and its suppressive effect on the antibiotic resistance were enhanced in the presence of ascorbic acid.

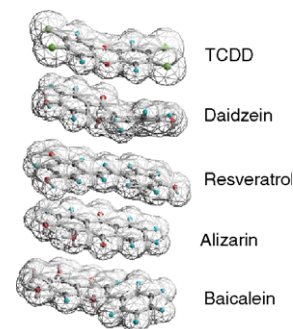


Influence of food polyphenols on aryl hydrocarbon receptor-signaling pathway estimated by *in vitro* bioassay

pp 3117–3130

Yoshiaki Amakura*, Tomoaki Tsutsumi, Kumiko Sasaki, Masafumi Nakamura, Takashi Yoshida, Tamio Maitani

The interaction of polyphenol constituents with an aryl hydrocarbon receptor (AhR) was determined by an *in vitro* bioassay: agonistic and antagonistic activities on AhR by polyphenolics and extracts of vegetable foods were reviewed.

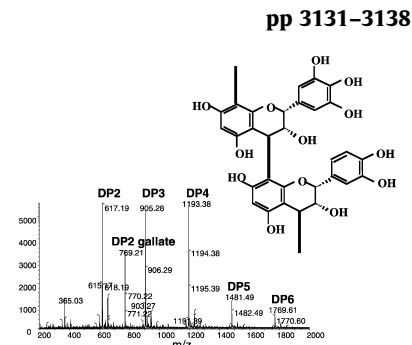


ANALYTICAL CHEMISTRY

Direct mass spectrometry approaches to characterize polyphenol composition of complex samples

Hélène Fulcrand, Carine Mané, Sébastien Preys, Gérard Mazerolles, Claire Bouchut, Jean-Paul Mazauric, Jean-Marc Souquet, Emmanuelle Meudec, Yan Li, Richard B. Cole, Véronique Cheynier*

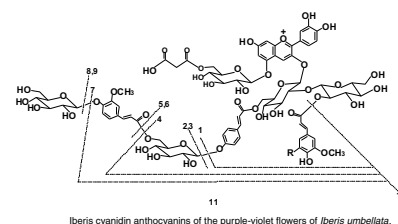
Approaches based on direct ESI-TOF and MALDI-TOF mass spectrometry are proposed for profiling phenolic compositions of plant extracts and for determination of proanthocyanidin molecular weight distributions. Higher molecular weight proanthocyanidins are difficult to detect due to poor ionization and fragmentation, but this has been overcome by analyzing their protein complexes.

**Tetra-acylated cyanidin 3-sophoroside-5-glucosides from the flowers of *Iberis umbellata* L. (Cruciferae)**

pp 3139–3150

Norio Saito, Fumi Tatsuzawa*, Eri Suenaga, Kenjiro Toki, Koichi Shinoda, Atsushi Shigihara, Toshio Honda

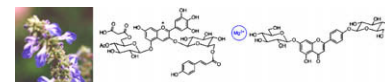
Eleven acylated cyanidin 3-sophoroside-5-glucosides (pigments **1–11**) were isolated from the flowers of *Iberis umbellata* cultivars (Cruciferae), and their structures were elucidated by chemical and spectroscopic methods.

**Cyanosalvianin, a supramolecular blue metalloanthocyanin, from petals of *Salvia uliginosa***

pp 3151–3158

Mihoko Mori, Tadao Kondo, Kumi Yoshida*

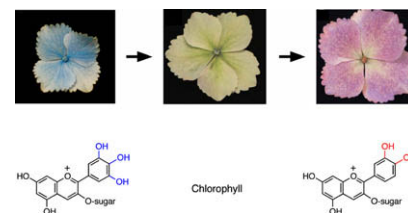
A metalloanthocyanin, cyanosalvianin, was found in the blue petals of *Salvia uliginosa*. Cyanosalvianin consisted of six molecules of anthocyanin, six molecules of flavone and two atoms of Mg^{2+} and has a similar structure to that of commelinin.

**Change of color and components in sepals of chameleon hydrangea during maturation and senescence**

pp 3159–3165

Kumi Yoshida*, Daisuke Ito, Yosuke Shinkai, Tadao Kondo

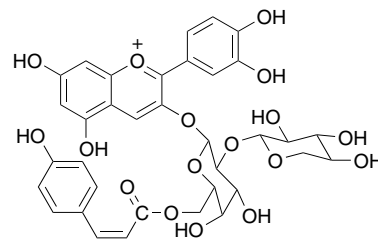
The sepal color change of a chameleon hydrangea, *Hydrangea macrophylla* cv. Hovaria™ 'Homigo' was due to the change of anthocyanin component from delphinidin glycoside to cyanidin glycoside.



Anthocyanins from red flowers of *Camellia* cultivar 'Dalicha'**pp 3166–3171**

Jian-Bin Li, Fumio Hashimoto*, Keiichi Shimizu, Yusuke Sakata

Five anthocyanins, cyanidin 3-O-(2-O- β -xylopyranosyl-6-O-(Z)-p-coumaroyl)- β -galactopyranoside and their related anthocyanins were isolated from *Camellia* cultivar 'Dalicha' (*Camellia reticulata*).

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* Corresponding author

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