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Obituary: Clarence A. “Bud” Ryan

pp 1454–1456

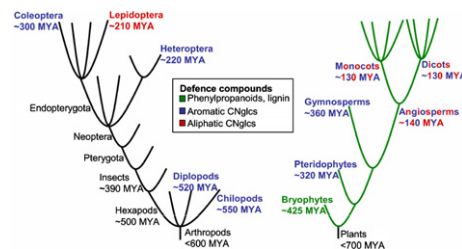
### MOLECULES OF INTEREST

Cyanogenesis in plants and arthropods

pp 1457–1468

Mika Zagrobelny, Søren Bak, Birger Lindberg Møller\*

Cyanogenic glucosides are well known defense compounds produced in both arthropods and plants. This review summarizes the knowledge of cyanogenesis in arthropods and plants and outlines the emerging important functions of these compounds in both phylae.



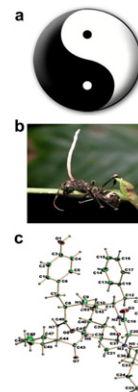
### REVIEW

*Cordyceps* – A traditional Chinese medicine and another fungal therapeutic biofactory?

pp 1469–1495

R. Russell M. Paterson

(a) The Yin and Yang symbol: The philosophical basis of some of the assumed properties and research on *Cordyceps* (see text)? (b) *Cordyceps* spp. parasitizing a dead *Campanotus* insect and (c) cordyheptapeptide A, a natural product from the fungus.



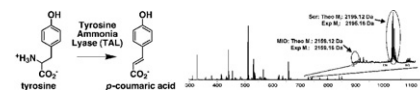
### PROTEIN BIOCHEMISTRY

Contributions of conserved serine and tyrosine residues to catalysis, ligand binding, and cofactor processing in the active site of tyrosine ammonia lyase

pp 1496–1506

Amy C. Schroeder, Sangaralingam Kumaran, Leslie M. Hicks, Rebecca E. Cahoon, Coralie Halls, Oliver Yu, Joseph M. Jez\*

Tyrosine ammonia lyase (TAL) catalyzes the conversion of L-tyrosine to *p*-coumaric acid using a 3,5-dihydro-5-methylidene-4H-imidazole-4-one (MIO) prosthetic group. Using a combination of site-directed mutagenesis, kinetic analysis, mass spectrometry, and fluorescence spectroscopy, the role of conserved active site residues are examined.



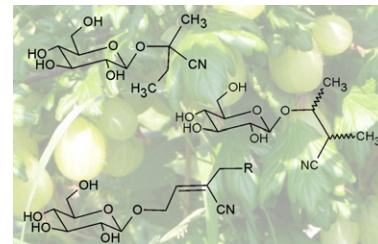
## METABOLISM

### Diversification of an ancient theme: Hydroxynitrile glucosides

pp 1507–1516

Nanna Bjarnholt, Fred Rook, Mohammed Saddik Motawia, Claus Cornett, Charlotte Jørgensen, Carl Erik Olsen, Jerzy W. Jaroszewski, Søren Bak, Birger Lindberg Møller\*

Three previously unknown  $\beta$ -hydroxynitrile glucosides were isolated from *Ribes uva-crispa* leaves: (2*Z*)-2-( $\beta$ -D-glucopyranosyloxy)but-2-enenitrile, (2*R*,3*R*)- and (2*R*,3*S*)-2-methyl-3-( $\beta$ -D-glucopyranosyloxy)butanenitrile. The data presented provide strong evidence that the biosynthetic pathways for  $\beta$ - and  $\gamma$ -hydroxynitrile glucosides represent a diversification of the pathway for cyanogenic glucoside biosynthesis.



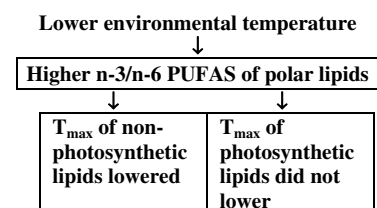
## ECOLOGICAL BIOCHEMISTRY

### Seasonal changes of fatty acid composition and thermotropic behavior of polar lipids from marine macrophytes

pp 1517–1527

Nina M. Sanina\*, Svetlana N. Goncharova, Eduard Y. Kostetsky

Fatty acid composition and thermotropic behavior of glyco-, phospho- and betaine lipids isolated from five species of marine macrophytes harvested in summer and winter were analyzed by GC, DSC and polarizing microscopy to clarify molecular mechanism of thermal adaptation of this plants to low and high environmental temperature.



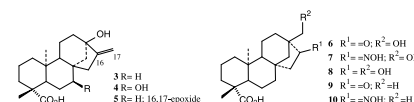
## BIOACTIVE PRODUCTS

### Plant growth regulation activity of steviol and derivatives

pp 1528–1533

Brás Heleno de Oliveira\*, Júlio César Stiirmer, José D. de Souza Filho, Ricardo Antonio Ayub

Kaurenes **3–5** and beyeranes **6–10** were prepared and tested for plant growth regulation activity using lettuce hypocotyl and barley aleurone bioassays. Steviol (**3**) and isosteviol (**9**) were also tested in field-grown grapes.

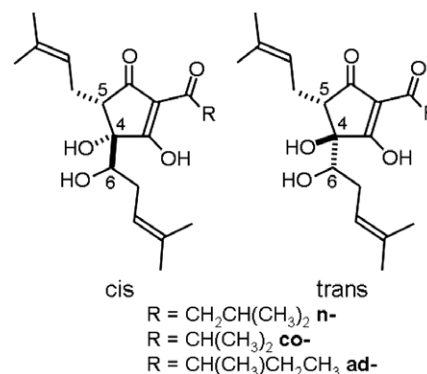


### Safety, efficacy and anti-inflammatory activity of rho iso-alpha-acids from hops

pp 1534–1547

Amy J. Hall\*, John G. Babish, Gary K. Darland, Brian J. Carroll, Veera Reedy Konda, Robert H. Lerman, Jeffery S. Bland, Matthew L. Tripp

Rho iso-alpha-acids (RIAA) is a modified extract from the flower cone of hops (*Humulus lupulus* L.). The safety profile and anti-inflammatory activity of RIAA was assessed using *in vitro* models and clinical biomarkers. This study suggests that RIAA is an alternative to NSAIDs with an expected reduction in adverse events.

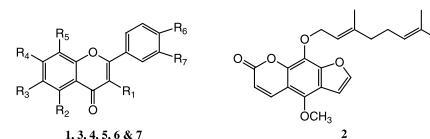


## Muscarinic receptor binding activity of polyoxygenated flavones from *Melicope subunifoliolata*

pp 1548–1554

L.Y. Chung\*, K.F. Yap, S.H. Goh, M.R. Mustafa, Z. Imiyabir

Six polymethoxyflavones [melibentin (**1**); melisimplexin (**3**); 3,3',4',5,7-pentamethoxyflavone (**4**); meliternatin (**5**); 3,5,8-trimethoxy-3',4',6,7-bismethylenedioxyflavone (**6**); and isokanugin (**7**)] and one furanocoumarin [5-methoxy-8-geranyloxypsoralen (**2**)] were isolated. Compounds **2** and **6** were isolated for the first time from *Melicope subunifoliolata*. The muscarinic receptor binding activities of these compounds were investigated.



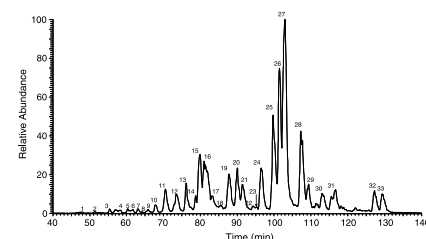
- (1) R<sub>1</sub>=OCH<sub>3</sub>, R<sub>2</sub>=OCH<sub>3</sub>, R<sub>3</sub>=OCH<sub>3</sub>, R<sub>4</sub>=OCH<sub>3</sub>, R<sub>5</sub>=OCH<sub>3</sub>, R<sub>6</sub>, R<sub>7</sub>=OCH<sub>2</sub>O-  
 (3) R<sub>1</sub>=OCH<sub>3</sub>, R<sub>2</sub>=OCH<sub>3</sub>, R<sub>3</sub>=OCH<sub>3</sub>, R<sub>4</sub>=OCH<sub>3</sub>, R<sub>5</sub>=H, R<sub>6</sub>, R<sub>7</sub>=OCH<sub>2</sub>O-  
 (4) R<sub>1</sub>=OCH<sub>3</sub>, R<sub>2</sub>=OCH<sub>3</sub>, R<sub>3</sub>=H, R<sub>4</sub>=OCH<sub>3</sub>, R<sub>5</sub>=H, R<sub>6</sub>=OCH<sub>3</sub>, R<sub>7</sub>=OCH<sub>3</sub>  
 (5) R<sub>1</sub>=OCH<sub>3</sub>, R<sub>2</sub>=OCH<sub>3</sub>, R<sub>3</sub>, R<sub>4</sub>=OCH<sub>2</sub>O-, R<sub>5</sub>=H, R<sub>6</sub>, R<sub>7</sub>=OCH<sub>2</sub>O-  
 (6) R<sub>1</sub>=OCH<sub>3</sub>, R<sub>2</sub>=OCH<sub>3</sub>, R<sub>3</sub>, R<sub>4</sub>=OCH<sub>2</sub>O-, R<sub>5</sub>=OCH<sub>3</sub>, R<sub>6</sub>, R<sub>7</sub>=OCH<sub>2</sub>O-  
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## Fingerprint profile of *Ginkgo biloba* nutritional supplements by LC/ESI-MS/MS

pp 1555–1564

S. Ding, E. Dudley\*, S. Plummer, J. Tang, R.P. Newton, A.G. Brenton

The effectiveness of fingerprint in quality control of plant extract is a very important issue. In this paper we describe a fingerprint profile method using a capillary HPLC/MS method which can identify more than 70 components from the *Ginkgo biloba* product. The fingerprint profiles of five commercial *G. biloba* nutritional supplements were obtained and compared.



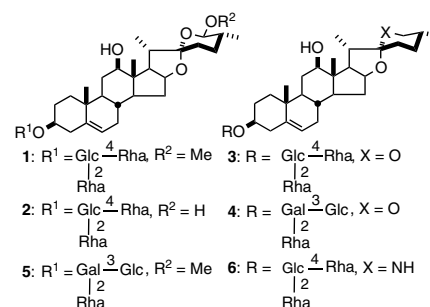
## CHEMISTRY

### Steroidal saponins and pseudoalkaloid oligoglycoside from Brazilian natural medicine, “fruta do lobo” (fruit of *Solanum lycocarpum*)

pp 1565–1572

Seikou Nakamura, Masako Hongo, Sachiko Sugimoto, Hisashi Matsuda, Masayuki Yoshikawa\*

Steroidal saponins, lyconosides Ia, Ib, II, III, and IV and a steroidal pseudoalkaloid oligoglycoside, lobo-frutoside, were isolated from a Brazilian natural medicine, “fruta do lobo” (the fruit of *Solanum lycocarpum* St. Hil.). The structures of the constituents were elucidated on the basis of chemical and physicochemical evidence.

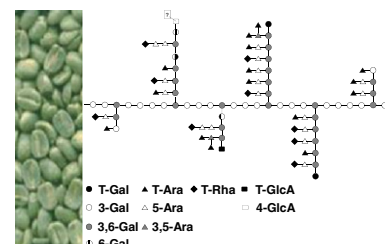


### Rhamnoarabinosyl and rhamnoarabinoarabinosyl side chains as structural features of coffee arabinogalactans

pp 1573–1585

Fernando M. Nunes\*, Ana Reis, Artur M.S. Silva, M. Rosário M. Domingues, Manuel A. Coimbra

Coffee beans contain 7% of a water soluble highly branched type II arabinogalactan-protein (AGP) having rhamnoarabinosyl and rhamnoarabinoarabinosyl side chains. These side chains are reported for the first time as structural features of plant AGPs.

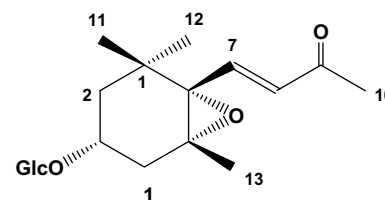


**Euodionosides A–G: Megastigmane glucosides from leaves of *Euodia meliaefolia***

pp 1586–1596

Miwako Yamamoto, Takeyuki Akita, Yuka Koyama, Etsuko Sueyoshi, Katsuyoshi Matsunami, Hideaki Otsuka\*, Takakazu Shinzato, Atsushi Takashima, Mitsunori Aramoto, Yoshio Takeda

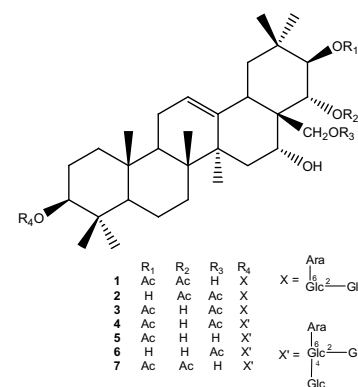
From leaves of *Euodia meliaefolia*, seven megastigmane glucosides (1–7) were isolated. The structures of euodionosides A–G (1–7) were established by the spectroscopic method and chemical evidence.

**Triterpenoidal saponins from *Hydrocotyle sibthorpioides***

pp 1597–1603

Hui-Chi Huang, Chia-Ching Liaw, Li-Jie Zhang, Hsi-Uo Ho, Li-Ming Yang Kuo, Ya-Ching Shen, Yao-Haur Kuo\*

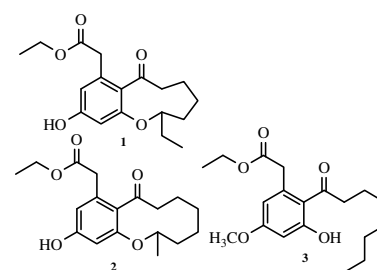
Oleanane-type triterpenoid saponins, hydrocosisaponins A–F (1–6), were isolated from *Hydrocotyle sibthorpioides* along with a known saponin, hydrocotyloside VII (7). Their structures were established by spectroscopic and chemical methods. The cytotoxic activity of saponins were evaluated several human tumor cell lines.

**Chemistry and weak antimicrobial activities of phomopsins produced by mangrove endophytic fungus *Phomopsis* sp. ZSU-H76**

pp 1604–1608

Zhongjing Huang, Xiaoling Cai, Changlun Shao, Zhigang She\*, Xuekui Xia, Yiguang Chen, Jianxiang Yang, Shining Zhou, Yongcheng Lin\*

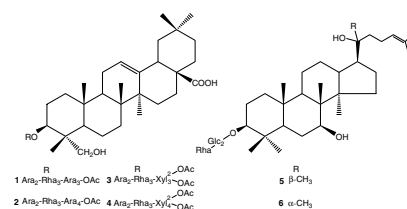
Three metabolites named phomopsin A (1), B (2) and C (3), together with two known compounds cytosporone B and C, were isolated from the mangrove endophytic fungus, *Phomopsis* sp. ZSU-H76. Their antimicrobial activities were tested.

**Triterpenoid saponins from the fruits and galls of *Sapindus mukorossi***

pp 1609–1616

Hui-Chi Huang, Ming-Der Wu, Wei-Jern Tsai, Sin-Chung Liao, Chia-Ching Liaw, Li-Chuan Hsu, Yang-Chang Wu\*, Yao-Haur Kuo\*

Four oleanane-type saponins (1–4) and two dammarane-type saponins (5 and 6), along with seven known saponins (7–13), were isolated from *Sapindus mukorossi*. Biological evaluation exhibited that oleanane-type saponins showed moderate cytotoxicity.

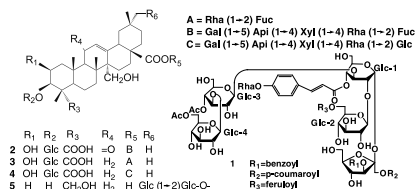


**Oligosaccharide polyester and triterpenoid saponins from the roots of *Polygala japonica***

pp 1617–1624

Jing Fu, Li Zuo, Jingzhi Yang, Ruoyun Chen, Dongming Zhang\*

An oligosaccharide polyester (1) and four triterpenoid saponins (2–5) along with five known compounds were isolated from the roots of *Polygala japonica*. Their structures were determined by 1D and 2D NMR spectroscopy, chemical methods and by comparison with data reported in the literature.

**OTHER CONTENTS****Announcement: The Phytochemical Society of Europe**

pp I–II

\* Corresponding author

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