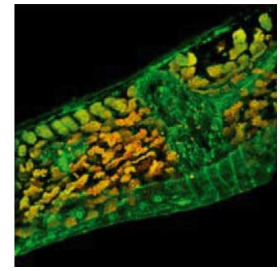
Phytochemistry, 2004, **65**, 783

Nitric oxide and nitric oxide synthase activity in plants

Luis A. del Río[a], F. Javier Corpas[a], Juan B. Barroso[b]

[a]*Departamento de Bioquímica, Biología Celular y Molecular de Plantas, Estación Experimental del Zaidín, CSIC, E-18080 Granada, Spain*
[b]*Grupo de Señalización Molecular y Sistemas Antioxidantes en Plantas, Unidad Asociada al CSIC (EEZ), Departamento de Bioquímica y Biología Molecular, Universidad de Jaén, E-23071 Jaén, Spain*



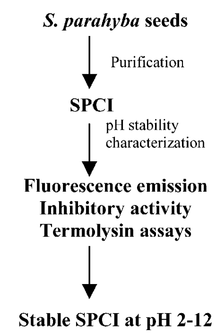
Nitric oxide (NO) has a key signalling role in plant growth and development processes, and in plant defense responses. The NO-producing enzymes identified are nitrate reductase, and several NOS-like activities. Two genes of plant proteins with NOS activity have been recently characterized, and they do not have sequence similarities to any mammalian NOS. However, there are other potential enzymatic sources of NO. The enzymatic generation of this signal molecule may be a much more common event than was initially thought.

Phytochemistry, 2004, **65**, 793

Purification and pH stability characterization of a chymotrypsin inhibitor from *Schizolobium parahyba* seeds

Rozeni C.L. Teles, Elizabeth M.T. de Souza, Leonardo de A. Calderon, Sonia M. de Freitas

Universidade de Brasília, Depto de Biologia Celular, Laboratório de Biofísica, Campus Universitário Darcy Ribeiro, Asa norte. 70910-900, Brasília, DF, Brazil



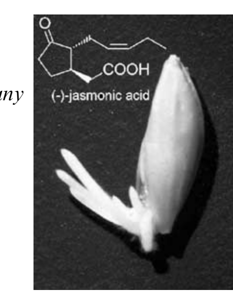
A Kunitz-type inhibitor (SPCI) purified from *S. parahyba* seeds had high stability for a broad range acidic, neutral and alkaline pH as judged by fluorescence emission, inhibitory activity and thermolysin resistance assays.

Phytochemistry, 2004, **65**, 801

The allene oxide cyclase of barley (*Hordeum vulgare* L.)—cloning and organ-specific expression

Helmut Maucher[b], Irene Stenzel[a], Otto Miersch[a], Niels Stein[b], Manoj Prasad[b], Uwe Zierold[b], Patrick Schweizer[b], Conrad Dorer[a], Bettina Hause[c], Claus Wasternack[a]

[a]*Institute of Plant Biochemistry, Department of Natural Product Biotechnology, Weinberg 3, D-06120 Halle, Germany*
[b]*Institute of Plant Science and Crop Research, Corrensstrasse 3, D-06466 Gatersleben, Germany*
[c]*Institute of Plant Biochemistry, Department of Secondary Metabolism, Weinberg 3, D-06120 Halle/S., Germany*



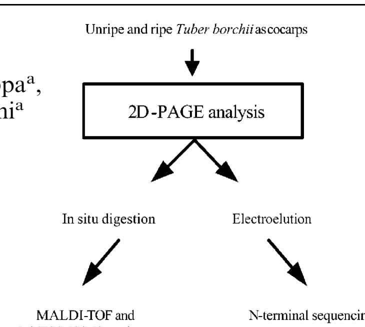
Barley plants contain one allene oxide cyclase and three allene oxide synthases which are up-regulated during seedling development accompanied by elevated levels of jasmonate.

Phytochemistry, 2004, **65**, 813

Tuber borchii fruit body: 2-dimensional profile and protein identification

Raffaella Pierleoni[a], Michele Buffalini[a], Luciana Vallorani[a], Chiara Guidi[a], Sabrina Zeppa[a], Cinzia Sacconi[a], Piero Pucci[b], Angela Amoresano[b], Annarita Casbarra[b], Vilberto Stocchi[a]

[a]*Istituto di Chimica Biologica "Giorgio Fornaini", Università degli Studi di Urbino "Carlo Bo", Via A. Saffi, 2, I-61029 Urbino (PU), Italy*
[b]*Dipartimento di Chimica Organica e Biochimica, Università degli Studi di Napoli "Federico II", Complesso Universitario Monte S. Angelo, Via Cynthia, 8, I-80126 Napoli, Italy*



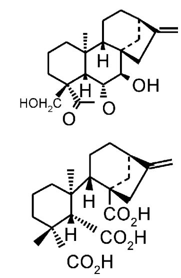
The first 2-DE maps of both ripe and unripe *Tuber borchii* fruit bodies were obtained and analysed. Four proteins with pivotal roles in truffle physiology were identified and some of them suggest that a general change in the metabolism of the fruit body occurs during ripening.

Phytochemistry, 2004, **65**, 821

Kaurenolides and fujenoic acids are side products of the gibberellin P450-1 monooxygenase in *Gibberella fujikuroi*

M. Cecilia Rojas[a], Oriana Urrutia[a], Carlos Cruz[a], Paul Gaskin[b], Bettina Tudzynski[c], Peter Hedden[b]

[a]*Departamento de Química, Laboratorio de Bioorgánica, Facultad de Ciencias, Universidad de Chile, Casilla 653, Santiago, Chile*
[b]*Rothamstead Research, Harpenden, Herts AL5 2JQ, UK*
[c]*Institüt für Botanik, Westfälische Wilhelms-Universität, Münster, Schlossgarten 3, D-48149 Münster, Germany*



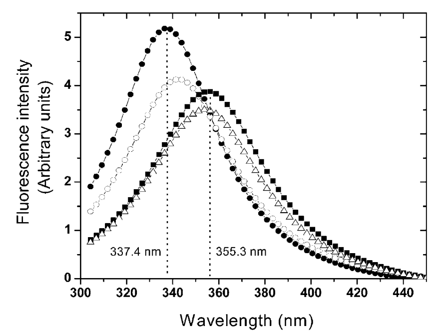
Besides catalyzing GA_{14} synthesis from *ent*-kaurenoic acid in the main pathway to gibberellins, the P450-1 monooxygenase from *Gibberella fujikuroi* is responsible for the oxidation steps involved in the two branch pathways to kaurenolides and fujenoic acids.

Phytochemistry, 2004, **65**, 831

Effect of chaotropic agents on reversible unfolding of a soybean (*Glycine max*) seed acid phosphatase

Alexandre Donizeti Martins Cavagis, Paulo Afonso Granjeiro,
Carmen Veríssima
Ferreira, Hiroshi Aoyama

Departamento de Bioquímica, Instituto de Biologia, Universidade Estadual de Campinas (UNICAMP), 13083-970, Campinas, São Paulo, Brazil



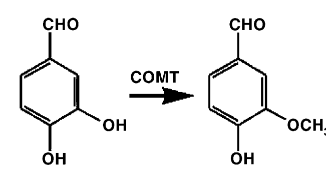
Changes in the intensity of fluorescence were observed when enzyme was treated with guanidinium chloride, with a red-shift in the maximum to 355 nm at 6 M.

Phytochemistry, 2004, **65**, 837

O-Methylation of benzaldehyde derivatives by "lignin specific" caffeic acid 3-*O*-methyltransferase*

Parvathi Kota[a], Dianjing Guo[a], Chloe Zubieta[b], Joe Noel[b], Richard A. Dixon[a]

[a]*Plant Biology Division, Samuel Roberts Noble Foundation, 2510 Sam Noble Parkway, Ardmore, OK 73401, USA*
[b]*Structural Biology Laboratory, The Salk Institute for Biological Studies, 10010 North Torrey Pines Road, La Jolla, CA 92037, USA*

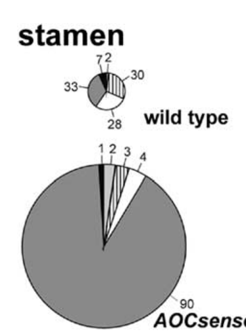


The enzyme known as caffeic acid 3-*O*-methyltransferase in the lignin pathway has higher catalytic activity against benzaldehyde derivatives than against monolignol precursors. Its relative substrate preference in vitro can be altered by structure-guided mutagenesis.

Phytochemistry, 2004, **65**, 847

Constitutive overexpression of allene oxide cyclase in tomato (*Lycopersicon esculentum* cv. Lukullus) elevates levels of some jasmonates and octadecanoids in flower organs but not in leaves

Otto Miersch[a], Heiko Weichert[b], Irene Stenzel[a], Bettina Hause[c], Helmut Maucher[d], Ivo Feussner[b], Claus Wasternack[a]



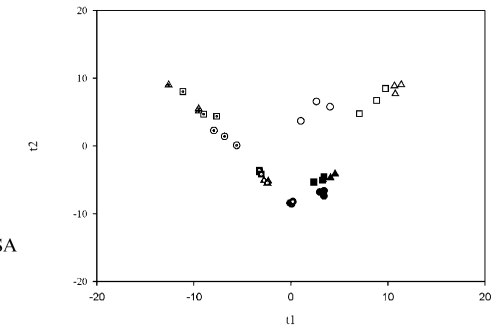
Constitutive overexpression of the *AOC* increases in all flower organs levels of some jasmonates and octadecanoids, alters the ratios among the compounds, decreases levels of free lipid hydro(per)oxy compounds and increases levels of free but not of esterified polyunsaturated fatty acids.

Phytochemistry, 2004, **65**, 857

Metabolic fingerprinting of wild type and transgenic tobacco plants by ^{1}H NMR and multivariate analysis technique

Hyung-Kyoon Choi[a,b], Young Hae Choi[a], Marianne Verberne[a], Alfons W.M. Lefeber[c], Cornelis Erkelens[c], Robert Verpoorte[a]

[a]*Department of Pharmacognosy, Section of Metabolomics, Institute of Biology, Leiden University, PO Box 9502, 2300 RA Leiden, The Netherlands*
[b]*College of Pharmacy, Chung-Ang University, Seoul 156-756, South Korea*
[c]*Division of NMR, Institute of Chemistry, Gorlaeus Laboratories, PO Box 9502, 2300 RA Leiden, The Netherlands*



The metabolomic analysis of wild type and constitutive salicylic acid producing tobacco plants (CSA tobacco, *Nicotiana tabacum* ‘Samsun’ NN) plants overexpressing salicylate biosynthetic genes was carried out by ^{1}H NMR spectrometry and multivariate analysis techniques.

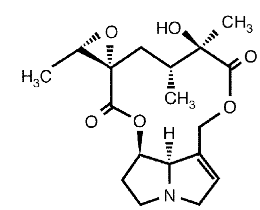
Phytochemistry, 2004, **65**, 865

Variation in pyrrolizidine alkaloid patterns of *Senecio jacobaea*

Mirka Macel, Klaas Vrieling, Peter G.L. Klinkhamer

Leiden University, Institute for Biology, Plant Ecology, PO Box 9516 2300 RA Leiden, The Netherlands

Ten pyrrolizidine alkaloids and four chemotypes are reported of vegetative plants of *Senecio jacobaea* populations and (clonal) families from across Europe.



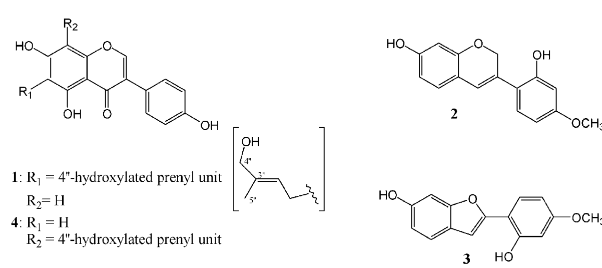
Phytochemistry, 2004, **65**, 875

New antimicrobial and antioxidant flavonoids from the root wood of *Bolusanthus speciosus*

Paul Erasto, Gomotsang Bojase-Moleta, Runner R.T. Majinda

Chemistry Department, University of Botswana, Private bag UB 00704, Gaborone, Botswana

Three new flavonoids; 5,7,4′-trihydroxy-6-[1-hydroxy-2-methylbuten-2-yl]isoflavone, 7,2′-dihydroxy-4′-methoxy-isoflav-3-ene, 6,6′-dihydroxy-4′-methoxy-2-arylbenzofuran, in addition to eight known flavonoids were isolated from the root wood of *Bolusanthus speciosus*. The isolated compounds show moderate activity against bacteria and fungi and some show strong radical scavenging properties against DPPH radical.

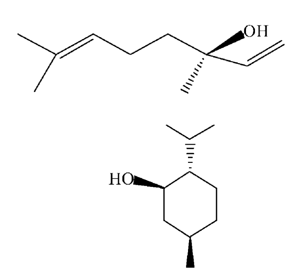


Phytochemistry, 2004, **65**, 881

Chemical composition and antimicrobial activity of the essential oil of *Scutellaria barbata*

Jianqing Yu[a], Jiachuan Lei[b], Huaidong Yu[a], Xuan Cai[b], Guolin Zou[a]

[a]*College of Life Sciences, Wuhan University, Wuhan 430072, People’s Republic of China*
[b]*Renmin Hospital, Wuhan University, Wuhan 430060, People’s Republic of China*



The essential oil of *Scutellaria barbata* has been studied. Forty-one components were identified. The antimicrobial activity of the oil was evaluated against 17 microorganisms, including bacteria and yeast. The gram-positive bacteria were the most sensitive.

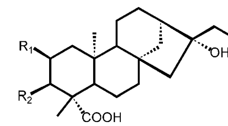
Phytochemistry, 2004, **65**, 885

ent-Kaurenoic acids from *Mikania hirsutissima* (Compositae)

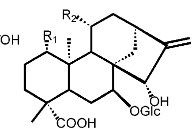
Emika Ohkoshi, Satoshi Kamo, Mitsuko Makino, Yasuo Fujimoto

College of Pharmacy, Nihon University, 7-7-1 Narashinodai, Funabashi, Chiba 274-8555, Japan

Four *ent*-kaurenoic acid derivatives were isolated together with five known compounds. Compounds **1** and **2** showed significant activity on the proliferation of human peripheral blood mononuclear cells.



1: R_1 = OH, R_2 = H
2: R_1 = H, R_2 = OH



3: R_1 = H, R_2 = OH
4: R_1 = OH, R_2 = H

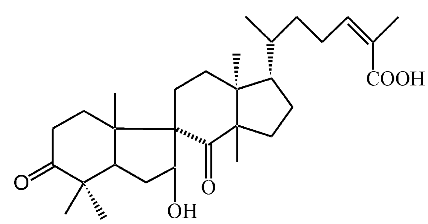
Phytochemistry, 2004, **65**, 891

Tirucallane-type triterpenes from *Juliania adstringens*

Mitsuko Makino, Tomohiro Motegi, Yasuo Fujimoto

College of Pharmacy, Nihon University, 7-7-1 Narashinodai, Funabashi, Chiba 274-8555, Japan

Five tirucallane-type triterpenes including one spiro compound (**5**) were isolated along with nine known triterpenes from the bark of *Juliania adstringens*. The structures of the new compounds were elucidated by various spectroscopic means.



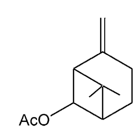
Compound **5**

Phytochemistry, 2004, **65**, 897

An acetylated monoterpene and a sesquiterpene alcohol from *Psiadia anchusifolia*

Anne Gauvin[a], Jacques Susperregui[b], Patrick Barth[c], Rémy Louis[c], Gérard Déléris[b], Jacqueline Smadja[a]

[a]*Laboratoire de Chimie des Substances Naturelles et des Sciences des Aliments, Faculté des Sciences et Technologies, Université de la Réunion, 15 Avenue René Cassin, BP 7151, 97715 St Denis Messag Cedex 9, La Réunion, France*
[b]*INSERM U577, Biomatériaux et Réparation Tissulaire, Groupe de Chimie Bio-Organique, Université Victor Segalen Bordeaux 2, 146 Rue Léo-Saignat, 33076 Bordeaux, France*
[c]*Laboratoire de Géochimie Bioorganique UMR 7509 et Groupe Structure et Spectroscopie, Université Louis Pasteur, Institut de Chimie, 1 Rue Blaise Pascal, BP 296R8, 67008 Strasbourg Cedex, France*



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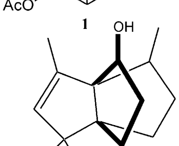


3

The acetylated monoterpene (**1**) and the unusual sesquiterpene alcohol (**3**) were detected as the major constituents of the essential oil of *Psiadia anchusifolia*. Isolation and identification of these two new compounds are reported.

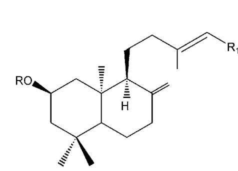
Phytochemistry, 2004, **65**, 903

Diterpenoids from *Calceolaria inamoena*

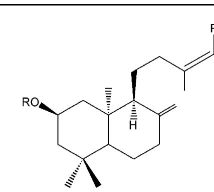
Juan A. Garbarino[a], María Cristina Chamy[a], Marisa Piovano[a], Luis Espinoza[a], Eliana Belmonte[b]

[a]*Departamento de Química, Universidad Técnica Federico Santa María, Casilla 110-V, Valparaíso, Chile*
[b]*Departamento de Arqueología y Museología, Universidad de Tarapacá, Casilla 673, Arica, Chile*

Four 9-*epi*-*ent*-labdanes were isolated from the aerial parts of *Calceolaria inamoena*. Their structures were elucidated by 1D- and 2D-NMR techniques.



	R	R_1
1	H	COOH
1a	H	COOMe
1b	Ac	COOMe
3	H	CHO
3a	Ac	CHO



	R	R_1
2	H	COOH
2a	H	COOMe
4	H	CHO

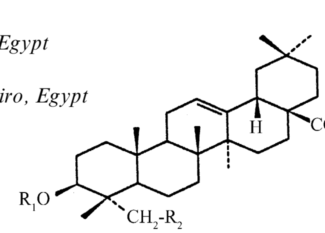
Phytochemistry, 2004, **65**, 909

Further saponins from *Meryta lanceolata*

F.R. Melek[a], Toshio Miyase[b], N.S. Ghaly[a], M.F. Yousif[c]

[a]*Chemistry of Natural Products Department, National Research Center, Dokki, 12622, Cairo, Egypt*
[b]*School of Pharmaceutical Sciences, University of Shizuoka, Shizuoka, 422-8526, Japan*
[c]*Pharmacognosy Department, Faculty of Pharmacy, Cairo University, Kasr-El-Aini, 11562, Cairo, Egypt*

Sixteen oleanane-type saponins were isolated from the leaves and stems of *Meryta lanceolata*. Their structures were established by 1D and 2D NMR as well as FAB-MS.



R_1: B-D-Glcp-(1→2)-B-D-GlcpA-
R_2: OH
R_3: a-L-Rhap-(1→4)-B-D-Glcp-(1→6)-B-D-Glcp-

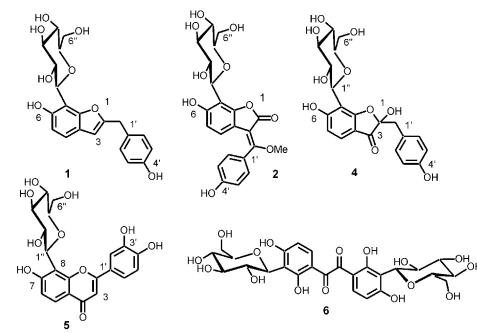
Phytochemistry, 2004, **65**, 915

Constituents of *Pterocarpus marsupium*: an ayurvedic crude drug

Rakesh Maurya[a], Rajinder Singh[b], Mundkinajeddu Deepak[b], S.S. Handa[b], Prem P. Yadav[a], Pushpesh K. Mishra[a]

[a]*Medicinal Chemistry Division, Central Drug Research Institute, Lucknow-226 001, India*
[b]*Regional Research Laboratory, Jammu 180 001, India*

Five new flavonoid *C*-glycosides **1**, **2**, **4-6**, were isolated from aqueous extract of *Pterocarpus marsupium* heartwood. The structure has been established using spectroscopic data.



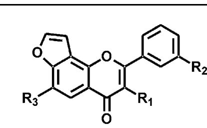
Phytochemistry, 2004, **65**, 921

Furanoflavonoid glycosides from *Pongamia pinnata* fruits

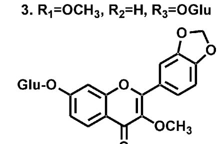
Ghufran Ahmad, Prem P. Yadav, Rakesh Maurya

Medicinal Chemistry Division, Central Drug Research Institute, Chattar Manzil Palace, Lucknow-226 001, India

Pongamia pinnata fruits afforded three new furanoflavonoid glucosides, pongamosides A-C (**1**–**3**), and a new flavonol glucoside, pongamoside D (**4**). The structures of these compounds were established on the basis of spectroscopic studies. This is the first time that furanoflavone glucosides have been found as naturally occurring compounds.



1. R_1=R_3=H, R_2=OGlu
2. R_1=H, R_2=OGlu, R_3=OCH_3,
3. R_1=OCH_3, R_2=H, R_3=OGlu



4

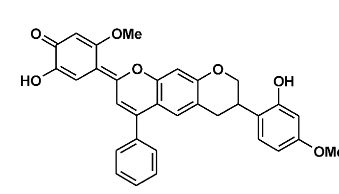
Phytochemistry, 2004, **65**, 925

Neocandenatone, an isoflavan-cinnamylphenol quinone methide pigment from *Dalbergia congestiflora*

Blanca E. Barragán-Huerta[a], Javier Peralta-Cruz[a], Rubén F. González-Laredo[b], Joe Karchesy[c]

[a]*Departamento de Química. Escuela Nacional de Ciencias Biológicas del IPN. Prolongación de Carpio y Plan de Ayala, 11340 D. F, Mexico*
[b]*Instituto Tecnológico de Durango. Dgo. 03400, Mexico*
[c]*College of Forestry, Oregon State University, Corvallis, OR, 97330 USA*

Neocandenatone, (vestitol[6→9″;7O→7″]obtusaquinone), purple pigment obtained from the campincerán tree was isolated and its structure elucidated by the spectroscopic techniques.

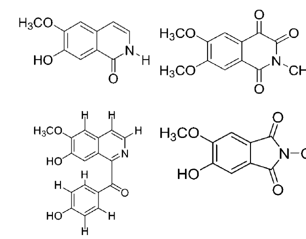


Phytochemistry, 2004, **65**, 929

Isoquinoline and isoindole alkaloids from *Menispermum dauricum*

Xiaoqi Zhang[a], Wencai Ye[a], Shouxun Zhao[a], Chun-Tao Che[b]

[a]*Department of Phytochemistry, China Pharmaceutical University, Nanjing 210009, China*
[b]*School of Chinese Medicine, the Chinese University of Hong Kong, Shatin, Hong Kong*



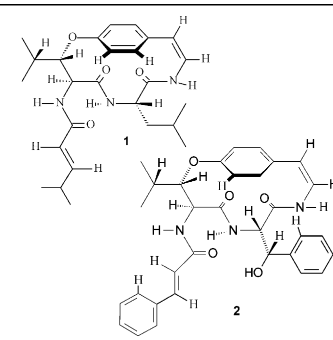
From the roots of *Menispermum dauricum*, an isoindole and three isoquinoline alkaloids were isolated and identified by spectroscopic analysis, together with eight known compounds.

Phytochemistry, 2004, **65**, 933

Cyclic peptide alkaloids from the bark of *Discaria americana*

Sandro R. Giacomelli, Graciela Maldaner, Wellington A. Gonzaga,
Claudia M. Garcia, Ubiratan F. da Silva, Ionara I. Dalcol, Ademir F. Morel

Departamento de Química, Universidade Federal de Santa Maria, 97105-900 Santa Maria RS, Brazil



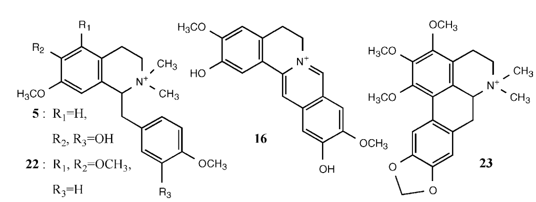
Two cyclic peptide alkaloids, discarine-M (**1**) and discarine-N (**2**), were isolated from root bark of *Discaria americana,* along with seven known cyclic peptide alkaloids (**3**–**9**). The crude methanol extract, the basic ether extract, and the alkaloids **6** and **7** also inhibited growth of various gram-negative and gram-positive bacteria.

Phytochemistry, 2004, **65**, 939

Quaternary isoquinoline alkaloids from *Xylopia parviflora*

Yumi Nishiyama[a], Masataka Moriyasu[a], Momoyo Ichimaru[a], Kinuko Iwasa[a], Atsushi Kato[a], Simon G. Mathenge[b], Patrick B. Chalo Mutiso[b], Francis D. Juma[c]

[a]*Natural Medicinal Chemistry, Kobe Pharmaceutical University, Higashinada-ku, Kobe 658-8558, Japan*
[b]*Department of Botany, University of Nairobi, PO Box 30197 Nairobi, Kenya*
[c]*Department of Clinical Pharmacology, Kenyatta National Hospital, University of Nairobi, PO Box 19676 Nairobi, Kenya*



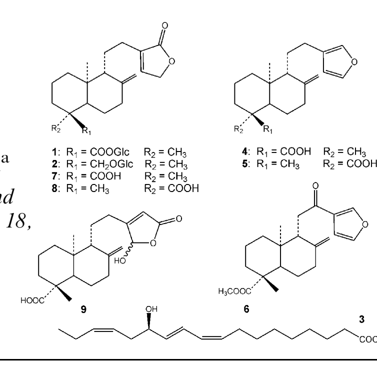
Four isoquinoline alkaloids, xylopinidine (**5**), dehydrocoreximine (**16**), *N*,*N*-dimethylanomurine (**22**) and *N*-methylphoebine (**23**) were isolated from the quaternary alkaloidal fraction of *Xylopia parviflora* (Annonaceae).

Phytochemistry, 2004, **65**, 945

ent-Labdane glycosides from the aquatic plant *Potamogeton lucens* and analytical evaluation of the lipophilic extract constituents of various *Potamogeton* species

Patrice Waridel[a], Jean-Luc Wolfender[a], Jean-Bernard Lachavanne[b], Kurt Hostettmann[a]

[a]*Institut de Pharmacognosie et Phytochimie, Université de Lausanne, CH-1015 Lausanne, Switzerland*
[b]*Laboratoire d'Ecologie et de Biologie Végétale Aquatique, Université de Genève, Ch. des Clochettes 18, CH-1206 Genève, Switzerland*



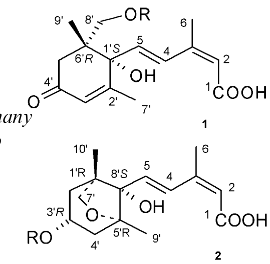
Two new glycosylated *ent*-labdanes diterpenes, one known furano-*ent*-labdane, and a new hydroxylated fatty acid were isolated from *Potamogeton lucens*. Other *ent*-labdanes were identified in the non-polar extract of *P. lucens* by LC–UV–MS analysis.

Phytochemistry, 2004, **65**, 955

Two glucosylated abscisic acid derivates from avocado seeds (*Persea americana* Mill. Lauraceae cv. Hass)

María del Refugio Ramos[a,b,c], Gerold Jerz[a], Socorro Villanueva[c], Fernando López-Dellamary[b], Reiner Waibel[d], Peter Winterhalter[a]

[a]*Institute of Food Chemistry, Technical University of Braunschweig, Schleinitz-Strasse 20, D-38106 Braunschweig, Germany*
[b]*University of Guadalajara, CUCEI, Department of Wood, Cellulose and Paper. Las Agujas S/N Zapopan, Jal., Mexico*
[c]*Research Center of Investigation, Technical and Design Assistance of Jalisco State, Av. Normalistas 800 C.P., 44270 Guadalajara, Jal., Mexico*
[d]*Institute of Medicinal Chemistry, University of Erlangen-Nürnberg, Schuhstrasse 19, D-91052 Erlangen, Germany*



Two glucosylated abscisic acid derivates from seeds of *Persea americana* were isolated and identified as (1′*S*,6′*R*)-8′-hydroxyabscisic acid β-D-glucoside (**1**) and (1′*R*,3′*R*,5′*R*,8′*S*)-*epi*-dihydrophaseic acid β-D-glucoside (**2**).

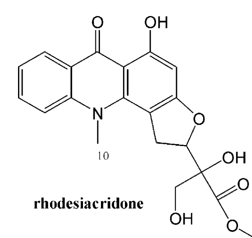
R: β-D-glucose

Phytochemistry, 2004, **65**, 963

Antileishmanial and antifungal acridone derivatives from the roots of *Thamnosma rhodesica*

Kouassi Maximin Ahua[a], Jean-Robert Ioset[a], Adriana Ransijn[b], Jacques Mauël[b], Steven Mavi[c], Kurt Hostettmann[a]

[a]*Institut de Pharmacognosie et Phytochimie, Université de Lausanne, BEP, CH-1015 Lausanne, Switzerland*
[b]*Institut de Biochimie, Université de Lausanne, Ch. des Boveresses 155, CH-1066 Epalinges, Switzerland*
[c]*Faculty of Pharmacy, University of Zimbabwe, Mount Pleasant, PO Box MP167, Harare, Zimbabwe*



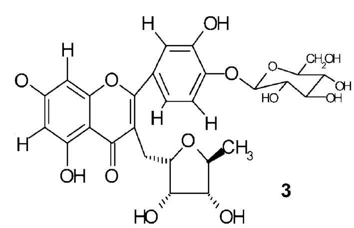
Eight furanocoumarins, one coumarin and four acridone derivatives have been identified in the roots of *Thamnosma rhodesica* (Rutaceae). Rhodesiacridone, a novel acridone derivative, showed activities against the intracellular form of *Leishmania major*. Two acridone related compounds, gravacridonediol and 1-hydroxy-10-methylacridone, exhibited activities against the intracellular form of the same parasite and the fungus *Cladosporium cucumerinum*, respectively.

Phytochemistry, 2004, **65**, 969

Flavone glucosides with immunomodulatory activity from the leaves of *Pleioblastus amarus*

Hong-Bing Wang[a], Hui Yao[b], Guan-Hu Bao[a], Hua-Ping Zhang[a], Guo-Wei Qin[a]

[a]*Shanghai Institute of Materia Medica, Shanghai Institutes of Biological Sciences, Chinese Academy of Sciences, Shanghai 201203, People's Republic of China*
[b]*Shanghai Jahwa United Co., Ltd., Shanghai 200056, People's Republic of China*



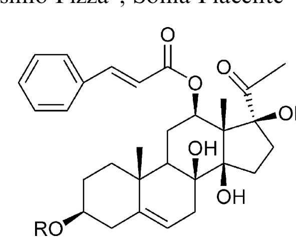
Three flavone glucosides, pleioside A–C (**1**–**3**) along with two known compounds were isolated and characterized from the leaves of *Pleioblastus amarus* (Gramineae). Compounds **1–3** possess immunomodulatory activities.

Phytochemistry, 2004, **65**, 975

Polyhydroxypregnane glycosides from *Oxystelma esculentum* var. *alpini*

Arafa I. Hamed[a], Mohamed G. Sheded[a], Abd El-Samei M. Shaheen[a], Fatma A. Hamada[a], Cosimo Pizza[b], Sonia Piacente[b]

[a]*Faculty of Science, South Valley University, Aswan 81528, Egypt*
[b]*Dipartimento di Scienze Farmaceutiche, Università degli Studi di Salerno, Via Ponte Don Melillo, I-84084 Fisciano, Salerno, Italy*



Three new polyhydroxypregnane glycosides named alpinosides A–C were isolated from *Oxystelma esculentum* var. *alpini* leaves. The structure elucidation was accomplished by extensive spectroscopic analysis and acid-catalyzed hydrolysis.