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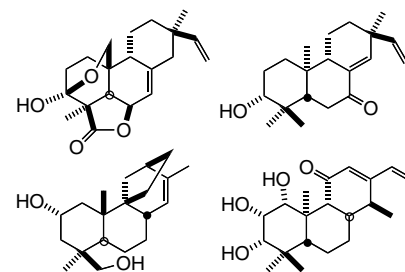
### MOLECULES OF INTEREST

#### Uncovering the complex metabolic network underlying diterpenoid phytoalexin biosynthesis in rice and other cereal crop plants

pp 2307–2317

Reuben J. Peters\*

Recent identification of the genes encoding diterpene synthases involved in rice phytoalexin biosynthesis has enabled insight into the evolution of the corresponding metabolic pathways, including evidence suggesting that this type of phytochemical production occurs throughout the cereal crop plant family and is an important component of their defense response.



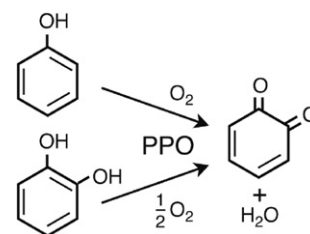
### REVIEW

#### Polyphenol oxidases in plants and fungi: Going places? A review

pp 2318–2331

Alfred M. Mayer\*

PPO, constitutive or induced by jasmonate, is coded for by multiple genes. It oxidizes mono- or dihydroxy phenols to the corresponding quinones. The products of its action have a function in resistance to pathogens and herbivores. PPO may be involved in biosynthesis processes.



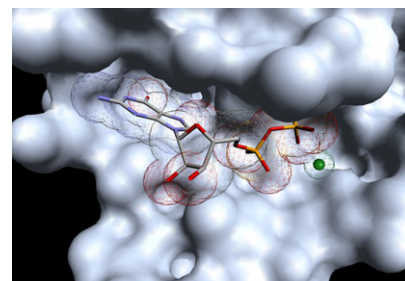
### PROTEIN BIOCHEMISTRY

#### The crystal structure of *Arabidopsis thaliana* RAC7/ROP9: The first RAS superfamily GTPase from the plant kingdom

pp 2332–2340

Christopher G. Sørmø, Ingar Leiros, Tore Brembu, Per Winge, Vibeke Os, Atle M. Bones\*

We present the first high resolution structure (1.78 Å) of a small Rho GTPase from plants. The *Arabidopsis thaliana* RAC7/ROP9 is an unique plant GTPase that has evolved only in vascular plants with homologues found in both monocyledonous and dicotyledonous plants.

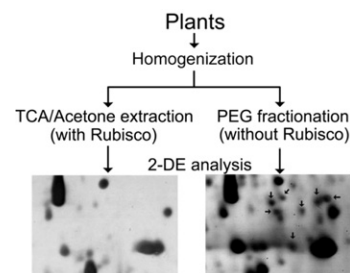


## Polyethylene glycol fractionation improved detection of low-abundant proteins by two-dimensional electrophoresis analysis of plant proteome

pp 2341–2348

Jinghui Xi, Xu Wang, Shanyu Li, Xin Zhou, Lin Yue, Jia Fan, Dongyun Hao\*

A differential polyethylene glycol fractionation protocol was developed for preparation of proteins in 2-DE analysis of plant proteome. The method was proven to detect a total 5077 proteins, among which ca. 80% were undetectable proteins with conventional TCA/acetone precipitation and the remainder exhibited a significant increase in their abundance.



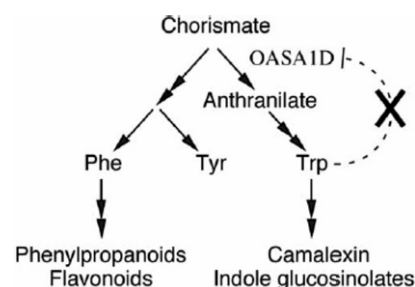
## MOLECULAR GENETICS AND GENOMICS

### Metabolic changes in *Arabidopsis thaliana* expressing the feedback-resistant anthranilate synthase $\alpha$ subunit gene *OASA1D*

pp 2349–2362

Atsushi Ishihara, Yohei Asada, Yoshitaka Takahashi, Naoto Yabe, Yoshibumi Komeda, Takaaki Nishioka, Hisashi Miyagawa, Kyo Wakasa\*

The introduction of feedback-resistant anthranilate synthase (AS)  $\alpha$  subunit gene *OASA1D* into *Arabidopsis* resulted in an increase of free Trp. The Trp level was correlated with the feedback sensitivity of AS. Indole glucosinolates increased in high-Trp accumulating transgenic plants, whereas phenylpropanoids and flavonoids decreased.



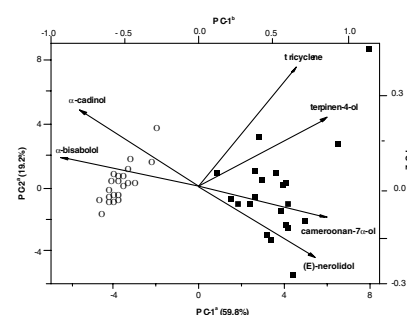
## ECOLOGICAL BIOCHEMISTRY

### Environmental factors influence on chemical polymorphism of the essential oils of *Lychnophora ericoides*

pp 2363–2369

Marco A. Curado, Carolina B.A. Oliveira, José G. Jesus, Suzana C. Santos, José C. Seraphin, Pedro H. Ferri\*

The essential oils of two populations of *Lychnophora ericoides* from the Brazilian Cerrado were analysed by GC-MS. Principal component and cluster analysis allowed two groups to be distinguished with respect to sampling site and scent characteristics. Canonical correlation between the soil sampling sites and the populations revealed a significant relationship between oil components and edaphic factors.



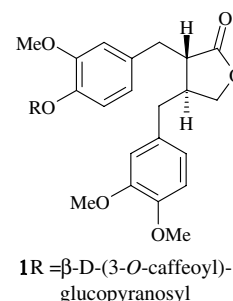
## BIOACTIVE PRODUCTS

### Americanin, a bioactive dibenzylbutyrolactone lignan, from the seeds of *Centaurea americana*

pp 2370–2375

Mohammad Shoeb, Stephen M. MacManus, Yashodharan Kumarasamy, Marcel Jaspars, Lutfun Nahar, Paul Kong Thoo-Lin, Hossein Nazemiyeh, Satyajit D. Sarker\*

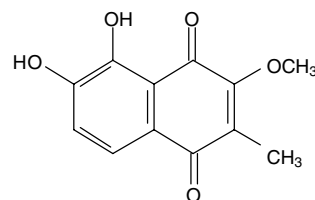
The reversed-phase preparative HPLC analysis of the methanol (MeOH) extract of the seeds of *Centaurea americana* afforded a dibenzylbutyrolactone lignan, 3''-O-caffeoyl arctiin (named americanin), together with five known lignans, arctiin, arctigenin, matairesinol, matairesinoside and lappaol A, and two known phytoecdysteroids, 20-hydroxyecdysone and makisterone A. The antioxidant properties and toxicity of the extracts and the isolated compounds were determined by the DPPH and the brine shrimp lethality assays, respectively.



**Malvone A, a phytoalexin found in *Malva sylvestris* (family Malvaceae)****pp 2376–2379**

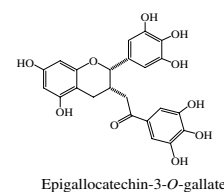
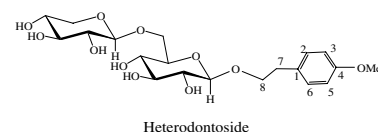
Olga Veshkurova, Zamira Golubenko, Egor Pshenichnov, Irina Arzanova, Vyacheslav Uzbekov, Elvira Sultanova, Shavkat Salikhov, Howard J. Williams, Joseph H. Reibenspies, Lorraine S. Puckhaber, Robert D. Stipanovic\*

The phytoalexin 2-methyl-3-methoxy-5,6-dihydroxy-1,4-naphthoquinone was identified in stems of *Malva sylvestris* that had been infected with the plant pathogen *Verticillium dahliae*.

**Comparative phytochemical characterization of three *Rhodiola* species****pp 2380–2391**

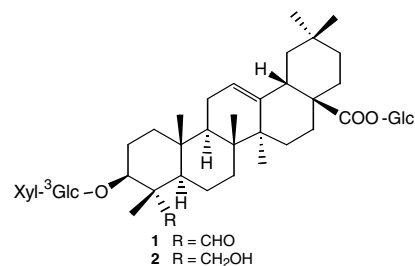
Gad G. Yousef, Mary H. Grace, Diana M. Cheng, Igor V. Belolipov, Ilya Raskin, Mary Ann Lila\*

In comparison to the well-recognized adaptogenic herb *Rhodiola rosea*, phytochemical constituents of two other *Rhodiola* species (*R. heterodonta* and *R. semenovii*) were elucidated and characterized. Chemical similarities among the three species were observed; however, each species displayed differences in phytochemical constituents. Cyanogenic glucosides were characteristic for all three species, but phenylethanoid or propanoid glycosides were detected only in *R. heterodonta* and *R. rosea*. A phenylethanoid glycoside; heterodontoside; was isolated from *R. heterodonta*. Proanthocyanidin oligomers and polymers, with different polymerization degrees, based on (–)-epigallocatechin gallate units (EGCG), were characteristic of all three *Rhodiola* species.

**Bioactive flavonoids and saponins from *Climacoptera obtusifolia*****pp 2392–2397**

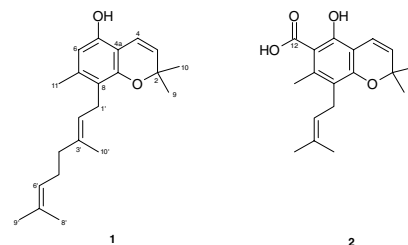
Balakyz Yeskaliyeva, M. Ahmed Mesaik, Ahmed Abbaskhan, Aisha Kulsoom, G. Sh. Burasheva, Zh. A. Abilov, M. Iqbal Choudhary\*, Atta-ur-Rahman

Two bidesmosidic saponins were isolated from *Climacoptera obtusifolia* and their structures were determined as glucosides of gypsogenin (1) and hederagenin (2), by spectroscopic methods. Compounds 3 and 4 were identified as a known flavonoids which showed strong inhibitory activity on neutrophil oxidative burst response. Compound 2 significantly suppressed (92%) the ROS generation on the mononuclear cells 50 µg/mL concentration.

**Chromenes from *Peperomia serpens* (Sw.) Loudon (Piperaceae)****pp 2398–2402**

Rodrigo O. Saga Kitamura, Paulete Romoff, Maria Cláudia M. Young, Massuo J. Kato, João Henrique G. Lago\*

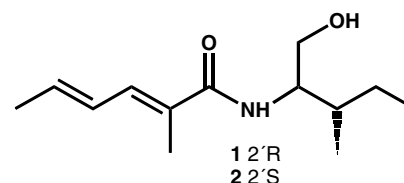
Chromatographic separation of the CH<sub>2</sub>Cl<sub>2</sub> extract from leaves of *Peperomia serpens* yielded two chromenes 1 and 2, besides two known compounds. The structural elucidations of these compounds were achieved by spectrometric analysis. Antifungal activities of the crude extract and the isolated chromenes were measured bioautographically against *Cladosporium cladosporioides* and *C. sphaerospermum*. This analysis indicated that crude extract showed higher potential as compared to pure compounds.



**Antimicrobial metabolites produced by an intertidal *Acremonium furcatum*****pp 2403–2410**

Gabriela L. Gallardo, Matías Butler, Mariana L. Gallo, M. Alejandra Rodríguez,  
Marcos N. Eberlin, Gabriela M. Cabrera\*

Amides of the aminoalcohols D-allo and L-isoleucinol were isolated and identified from the fungal culture of an intertidal marine *Acremonium furcatum*.

**OTHER CONTENTS****Announcement: The Phytochemical Society of Europe****p I****Author Index****p II****Guide for Authors****pp III–IV**

\* Corresponding author

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