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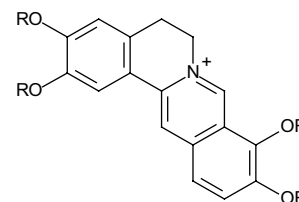
REVIEW

Quaternary protoberberine alkaloids

pp 150–175

Lenka Grycová, Jiří Dostál, Radek Marek*

This contribution reviews some general aspects of the quaternary iminium protoberberine alkaloids, including their plant sources, isolation procedures, analytical methods, spectral data, and reactivity. Examples of pharmacological effects and interactions with biological targets are described.



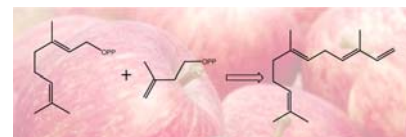
MOLECULAR GENETICS AND GENOMICS

Unusual features of a recombinant apple α -farnesene synthase

pp 176–188

Sol Green*, Ellen N. Friel, Adam Matich, Lesley L. Beuning, Janine M. Cooney, Daryl D. Rowan, Elspeth MacRae

Functional and kinetic analysis of a recombinant α -farnesene synthase from apple skin identified a prenyltransferase activity allowing biosynthesis of α -farnesene directly from geranyl diphosphate and isopentenyl diphosphate. Mutagenesis of the DDXXD active site motif abolished α -farnesene and monoterpene synthase, and prenyltransferase activities of this enzyme.



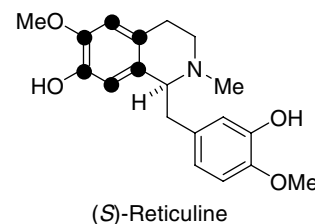
METABOLISM

Poppy alkaloid profiling by electrospray tandem mass spectrometry and electrospray FT-ICR mass spectrometry after [*ring*- $^{13}\text{C}_6$]-tyramine feeding

pp 189–202

Jürgen Schmidt*, Chotima Boettcher, Christine Kuhnt, Toni M. Kutchan, Meinhart H. Zenk

[*ring*- $^{13}\text{C}_6$]-Tyramine as a biogenetic precursor of *Papaver* alkaloids was fed to *Papaver somniferum* seedlings. The alkaloid pattern was elucidated both by direct infusion high-resolution ESI-FT-ICR mass spectrometry and liquid chromatography/electrospray tandem mass spectrometry. The structure of about 20 alkaloids displaying an incorporation of the [*ring*- $^{13}\text{C}_6$]-labeled tyramine could be elucidated. These alkaloids belong to morphinans, benzyloisoquinolines, protoberberines, benzo[*c*]phenanthridines, phthalide isoquinolines and protopines. The information gained from the alkaloid profile demonstrates that the combination of these two mass spectrometric methods represents a powerful tool for evaluating biochemical pathways and facilitates the study of the flux of distant precursors into these natural products.



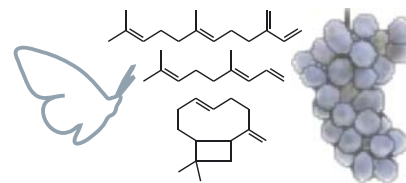
ECOLOGICAL BIOCHEMISTRY

Synergism and redundancy in a plant volatile blend attracting grapevine moth females

pp 203–209

Marco Tasin, Anna-Carin Bäckman, Miryan Coracini, Daniel Casado, Claudio Ioriatti, Peter Witzgall*

Grapevine moth females flew upwind to a blend of β -caryophyllene, (*E*)- β -farnesene and (*E*)-4,8-dimethyl-1,3,7-nonatriene. Leaving out any compound from this blend almost abolished attraction. Substituting these three compounds with other grape volatiles, which are perceived by the female antenna, partly restored attraction.



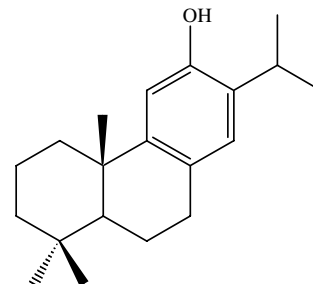
BIOACTIVE PRODUCTS

Antibacterials and modulators of bacterial resistance from the immature cones of *Chamaecyparis lawsoniana*

pp 210–217

Eileen C.J. Smith, Elizabeth M. Williamson, Neale Wareham, Glenn W. Kaatz, Simon Gibbons*

Several anti-staphylococcal diterpenes were isolated from the immature cones of the conifer *Chamaecyparis lawsoniana*. The most active, ferruginol, caused an 80-fold potentiation of oxacillin activity against EMRSA-15, with more modest potentiation of antibiotic activity against effluxing clinical isolates of *Staphylococcus aureus*. The results of an efflux inhibition assay suggest that ferruginol is a weak efflux pump inhibitor.

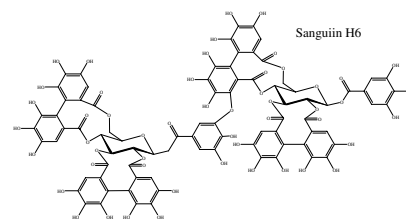


Antiproliferative activity is predominantly associated with ellagitannins in raspberry extracts

pp 218–228

Heather A. Ross, Gordon J. McDougall*, Derek Stewart

Raspberry extracts enriched in ellagitannins were more effective in inhibiting the in vitro growth of cancer cells than extracts enriched in anthocyanins.



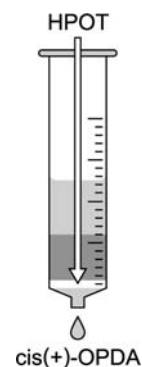
CHEMISTRY

Preparative enzymatic solid phase synthesis of *cis*(+)-12-oxo-phytodienoic acid – physical interaction of AOS and AOC is not necessary

pp 229–236

Philipp Zerbe, Elmar W. Weiler, Florian Schaller*

A cheap and time sparing solid phase biosynthesis of the octadecanoid *cis*(+)-12-oxo-phytodienoic acid is provided to the “jasmonate community”. With this method high amounts of enantioselective oxylipin metabolites can be synthesized for physiological studies and octadecanoid-metabolomics.

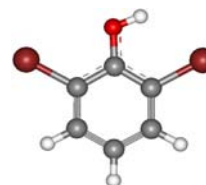


Unrevealed structural requirements for auxin-like molecules by theoretical and experimental evidences

pp 237–250

Noel Ferro, Patrick Bultinck, Ana Gallegos, Hans-Jörg Jacobsen, Ramon Carbo-Dorca, Thomas Reinard*

Quantum chemical methods and biostatistical analysis have detected flexible structure–activity requirements of auxin-like molecules linked to hardness (η HOMO–LUMO gap). A decarboxylated organobromine compound (2,6-dibromophenol) shows auxin like effects.

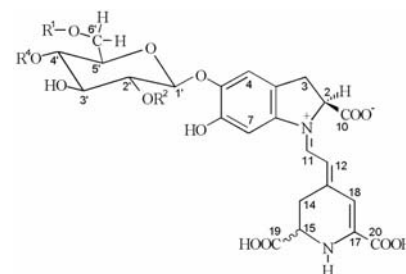


Minor betalains in fruits of *Hylocereus* species

pp 251–259

Sławomir Wybraniec*, Barbara Nowak-Wydra, Katarzyna Mitka, Piotr Kowalski, Yosef Mizrahi

Betalains of fruit peel and flesh of *Hylocereus* cacti are presented. The sinapoyl moiety was found in the structure of betacyanins from fruit peel and the migration of the phyllocactin malonyl group was noticed for the first time.



OTHER CONTENTS

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ISSN 0031-9422

INDEXED/ABSTRACTED IN: *Current Awareness in Biological Sciences (CABS)*, *Curr Cont ASCA*, *Chem. Abstr.*, *BIOSIS Data*, *PASCAL-CNRS Data*, *CAB Inter*, *Cam Sci Abstr*, *Curr Cont/Agri Bio Env Sci*, *Curr Cont/Life Sci*, *Curr Cont Sci Cit Ind*, *Curr Cont SCISEARCH Data*, *Bio Agri Ind*. Also covered in the abstract and citation database SCOPUS®. Full text available on ScienceDirect®.

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