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Special issue

Rod Croteau (Part 1)

Editor: Norman G. Lewis

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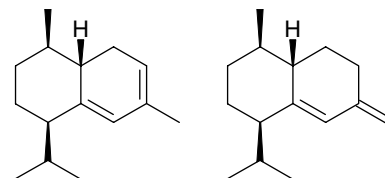
MOLECULAR GENETICS AND GENOMICS

Cloning and functional characterisation of a *cis*-muuroladiene synthase from black peppermint (*Mentha × piperita*) and direct evidence for a chemotype unable to synthesise farnesene

pp 1564–1571

Ian M. Prosser, Racheal J. Adams, Michael H. Beale, Nathan D. Hawkins, Andrew L. Phillips, John A. Pickett, Linda M. Field*

A sesquiterpene synthase has been cloned from *Mentha x piperita*, whose main products are *cis*-muurola-3,5-diene and *cis*-muurola-4(14)5-diene. An inactive *E*-β-farnesene synthase contributed to the lack of detectable farnesene in this ecotype.

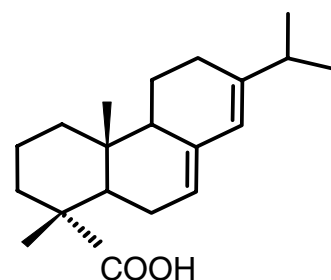


Diterpene resin acid biosynthesis in loblolly pine (*Pinus taeda*): Functional characterization of abietadiene/levopimaradiene synthase (*PtTPS-LAS*) cDNA and subcellular targeting of *PtTPS-LAS* and abietadienol/abietadienal oxidase (*PtAO*, *CYP720B1*)

pp 1572–1578

Dae-Kyun Ro, Jörg Bohlmann*

Diterpene resin acids are major components of conifer oleoresin defenses.

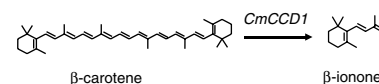


Functional characterization of *CmCCD1*, a carotenoid cleavage dioxygenase from melon

pp 1579–1589

Mwafaq Ibdah, Yaniv Azulay, Vitaly Portnoy, Boris Wasserman, Einat Bar, Ayala Meir, Yossi Burger, Joseph Hirschberg, Arthur A. Schaffer, Nurit Katzir, Yaakov Tadmor, Efraim Lewinsohn*

Orange-colored melon varieties contain both β-carotene and β-ionone, while pale green and white varieties have low to undetectable levels of both compounds. A melon carotenoid cleavage dioxygenase gene has been functionally characterized by overexpression in *Escherichia coli* strains previously engineered to produce different carotenoids, releasing their corresponding apocarotenoid derivatives.

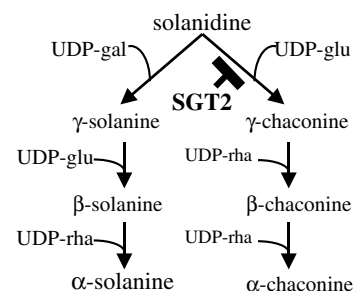


The primary *in vivo* steroidal alkaloid glucosyltransferase from potato

pp 1590–1597

Kent F. McCue*, Paul V. Allen, Louise V.T. Shepherd, Alison Blake, Jonathan Whitworth, M. Malendia Maccree, David R. Rockhold, Derek Stewart, Howard V. Davies, William R. Belknap

Transgenic plants expressing antisense *Sgt2* under the transcriptional control of the granule bound starch synthase promoter showed an increase in α -solanine accumulation and a reduction in α -chaconine levels in tubers. Substrate preference for recombinant SGT2 demonstrated its primary activity as the UDP-glucose:solanidine glucosyl transferase.

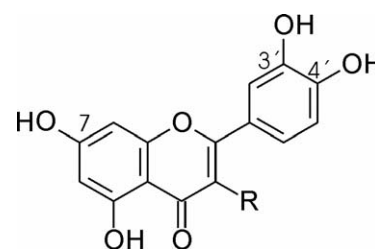


Cloning and functional characterisation of two regioselective flavonoid glucosyltransferases from *Beta vulgaris*

pp 1598–1612

Judith Isayenkova, Victor Wray, Manfred Nimtz, Dieter Strack, Thomas Vogt*

Two regioselective flavonol (R = OH) and flavone (R = H) glucosyltransferases from *Beta vulgaris* were cloned and functionally expressed in *Escherichia coli*. Enzyme activities are discussed with respect to substrate and position specificities as well as evolutionary aspects.



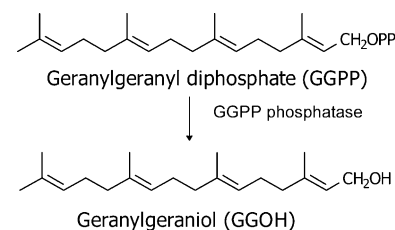
PROTEIN BIOCHEMISTRY

Membrane-bound geranylgeranyl diphosphate phosphatases: Purification and characterization from *Croton stellatopilosus* leaves

pp 1613–1620

Natsajee Nualkaew, Wanchai De-Eknamkul*, Toni M. Kutchan, Meinhart H. Zenk

Two forms of membrane-bound geranylgeranyl diphosphate phosphatases catalyzing the dephosphorylation of GGPP to form GGOH were solubilized, purified and characterized from *Croton stellatopilosus* leaves.

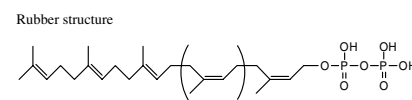


Magnesium ion regulation of *in vitro* rubber biosynthesis by *Parthenium argentatum* Gray

pp 1621–1628

Bernardo M.T. da Costa, Jay D. Keasling, Colleen M. McMahan, Katrina Cornish*

The rate of rubber biosynthesis and the molecular weight of the rubber produced are both strongly affected by $[Mg^{2+}]$ in *Parthenium argentatum*.

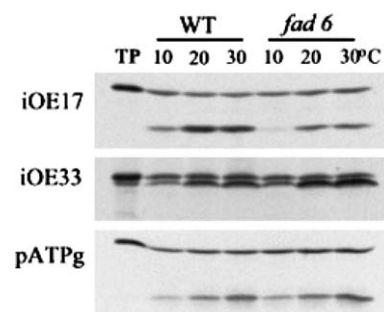


Altered rates of protein transport in *Arabidopsis* mutants deficient in chloroplast membrane unsaturation

pp 1629–1636

Xianyue Ma, John Browse*

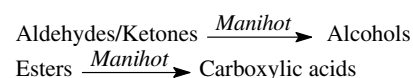
Thylakoid protein transport on the ΔpH /Tat pathway was greatly reduced in mutants of *Arabidopsis* with decreased unsaturation of thylakoid lipids. It is likely that this decreased transport compromises chloroplast biogenesis at low temperature.

**Bioreduction of aldehydes and ketones using *Manihot* species**

pp 1637–1643

Luciana L. Machado, João Sammy N. Souza, Marcos Carlos de Mattos, Solange K. Sakata, Geoffrey A. Cordell, Telma L.G. Lemos*

A series of aliphatic and aromatic aldehydes and ketones were reduced using aqueous plant cell preparations from *Manihot esculenta* and *Manihot dulcis* roots. The reduced products were typically obtained in excellent yields (80–96%), and with very good enantiomeric excess (94–98%). Hydrolysis products were observed with esters, while a nitrile and an amide were unreacted, as was vanillin. Preliminary conversion rate studies are reported.

**Isolation and characterization of iso inhibitors of the potato protease inhibitor I family from the latex of the rubber trees, *Hevea brasiliensis***

pp 1644–1650

Wannapa Sritanyarat, Gregory Pearce, William F. Siems, Clarence A. Ryan*, Rapepun Wititsuwannakul, Dhirayos Wititsuwannakul*

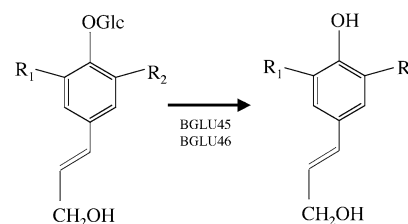
Centrifuging the latex the rubber tree *Hevea brasiliensis* separates a rubber fraction (top layer); a clear C-serum fraction (center layer); and a lutoid fraction (bottom layer). Three wound-inducible subtilisin A iso inhibitors of the Potato inhibitor I family were purified from the C-serum and characterized.

***Arabidopsis thaliana* β -Glucosidases BGLU45 and BGLU46 hydrolyse monolignol glucosides**

pp 1651–1660

Luis L. Escamilla-Treviño, Wei Chen, Marcella L. Card, Ming-Che Shih, Chi-Lien Cheng, Jonathan E. Poulton*

Biochemical and molecular evidence are provided to support the hypothesis that *Arabidopsis thaliana* β -glucosidases BGLU45 (Atlg61810) and BGLU46 (Atlg61820) participate in a monolignol glucoside/ β -glucosidase system in lignification.



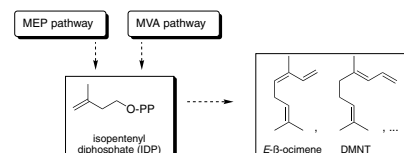
METABOLISM

Dynamic pathway allocation in early terpenoid biosynthesis of stress-induced lima bean leaves

pp 1661–1672

Stefan Bartram, Andreas Jux, Gerd Gleixner, Wilhelm Boland*

Elicitor-dependent pathway allocation of early terpenoid biosynthesis was studied in lima bean with independent methods including “non-invasive” isotopic ratio mass spectrometry.



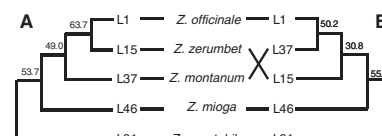
CHEMOTAXONOMY

Metabolic profiling and phylogenetic analysis of medicinal *Zingiber* species: Tools for authentication of ginger (*Zingiber officinale* Rosc.)

pp 1673–1685

Hongliang Jiang, Zhengzhi Xie, Hyun Jo Koo, Steven P. McLaughlin, Barbara N. Timmermann, David R. Gang*

Molecular and chemical data can be used to distinguish ginger from other medicinal plants in *Zingiber*. In addition, phylogeny based on the DNA sequences (A) matched closely the phylogeny based on chemical profiles (B) for these *Zingiber* species.



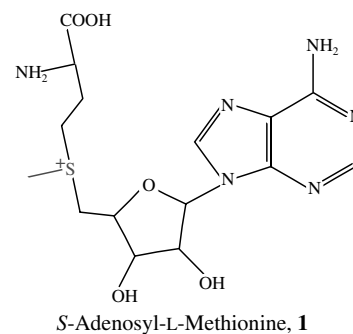
REVIEW

S-Adenosyl-L-methionine: Beyond the universal methyl group donor

pp 1686–1698

Sanja Roje*

S-Adenosyl-L-methionine is the source of methyl, aminopropyl, carboxypropyl, and other moieties for numerous enzyme-catalyzed reactions in plants.



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* Corresponding author

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