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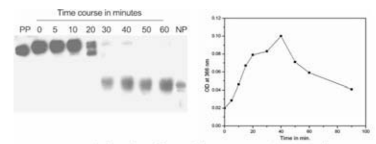
Contents

Debi Choudhury, Sumana Roy, Chandana Chakrabarti, Sampa Biswas, J.K. Dattagupta*

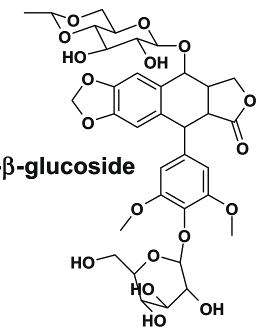
A high yield heterologous expression and refolding protocol for recombinant propapain from *Escherichia coli* inclusion bodies is reported. This recombinant propapain can be activated to mature papain at low pH and its specific activity has been compared with commercially available papain isolated from natural source.



Activation of recombinant propapain to papain

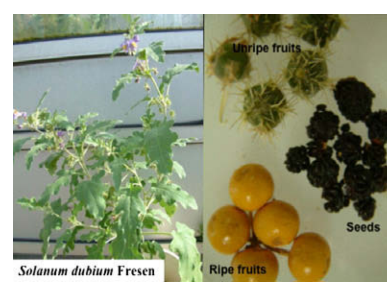
Esben Halkjær Hansen*, Sarah A. Osmani, Charlotte Kristensen, Birger Lindberg Møller, Jørgen Hansen

Chimeric family 1 UDP-glucose glycosyltransferases (UGTs) with substrates specificities were constructed. Twelve active chimeras were obtained, using domains of the UGTs 71C1, 71C2, 71E1 and 85C1, of two different plant species. Among activities observed were regio-specific glycosylation of resveratrol and increased efficiency of etoposide glycosylation.


Etoposide-β-glucoside

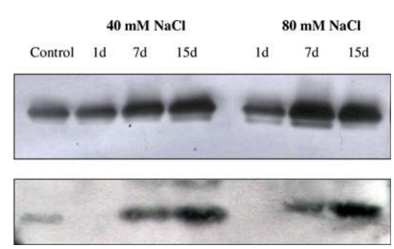
Isam A. Mohamed Ahmed, Isao Morishima, Elfadil E. Babiker, Nobuhiro Mori*

Solanum dubium Fresen, a weed plant in the family Solanaceae, is locally known in Sudan as Gubbien because of its milk-clotting ability. A highly stable serine protease from the seeds of this plant was purified and characterized. Its enzymatic characteristics suggest possible application of the enzyme in food and biotechnological industries.



Luis López-Pérez, María del Carmen Martínez-Ballesta, Christophe Maurel, Micaela Carvajal*

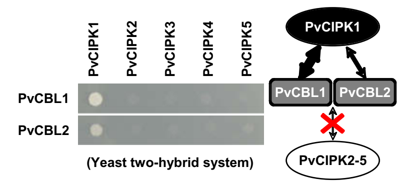
The lipid composition and PIP1 and PIP2 aquaporin expression of plasma membrane vesicles of broccoli roots were evaluated for different levels of NaCl. Long time salt exposition caused an increase in the abundance of two PIPs isoforms and modified membrane lipid composition. These changes could affect the membrane stability and control the water permeability, as a mechanism of acclimation to salinity.



MOLECULAR GENETICS AND GENOMICS

Expression and interaction of the CBLs and CIPKs from immature seeds of kidney bean (*Phaseolus vulgaris* L.) **pp 501–507**

Shigeki Hamada, Yoshiko Seiki, Kazuhiro Watanabe, Takashi Ozeki, Hirokazu Matsui, Hiroyuki Ito*

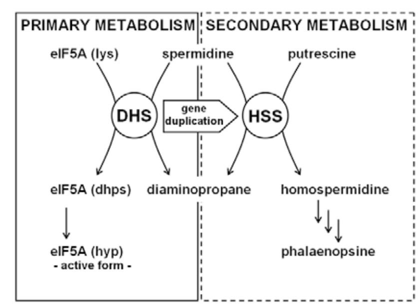


Using the yeast two-hybrid system, the interaction between CBLs and CIPKs isolated from kidney bean seeds was investigated. The present data indicates that calcium-dependent protein phosphorylation-signaling via CBLs–CIPKs occurs during plant seed development.

METABOLISM

Evolution of pyrrolizidine alkaloids in *Phalaenopsis* orchids and other monocotyledons: Identification of deoxyhypusine synthase, homospermidine synthase and related pseudogenes **pp 508–516**

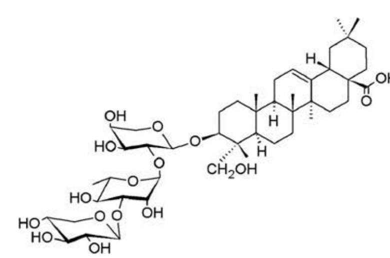
Niknik Nurhayati, Daniela Gondé, Dietrich Ober*



Phalaenopsis orchids produce pyrrolizidine alkaloids of the phalaenopsine type. Homospermidine synthase, the first specific enzyme of pyrrolizidine alkaloid biosynthesis, and the related deoxyhypusine synthase were identified together with several pseudogenes as remnants of ongoing gene duplication events in orchids.

Methyl jasmonate induced accumulation of kalopanaxsaponin I in *Nigella sativa* **pp 517–522**

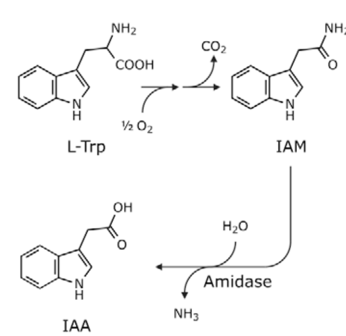
Martin Scholz, Marta Lipinski, Marco Leupold, Heinrich Luftmann, Lena Harig, Rivka Ofir, Rainer Fischer, Dirk Prüfer*, Kai J. Müller



Nigella sativa plants growing in hydroponic systems produce increased amounts of kalopanaxsaponin I upon treatment with methyl jasmonate. To further address this observation on molecular level we cloned and functionally characterized the *β-amyrin synthase* gene (*NsβAS1*), which encodes one of the key enzymes of triterpene saponin biosynthesis.

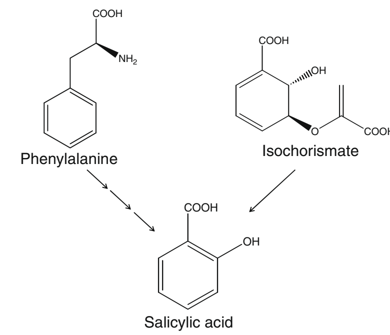
Tryptophan-dependent indole-3-acetic acid biosynthesis by 'IAA-synthase' proceeds via indole-3-acetamide **pp 523–531**

Stephan Pollmann*, Petra Düchting, Elmar W. Weiler



To analyze the conversion of L-tryptophan (L-trp) to indole-3-acetic acid (IAA) *in vitro*, isotope labeling and GC–MS/MS techniques were used. Cell free protein extracts convert L-trp to IAA via the intermediate indole-3-acetamide, which has earlier been shown to be endogenous to *Arabidopsis thaliana*.

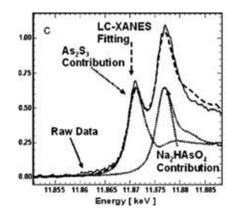
Natali R. Mustafa, Hye Kyong Kim, Young Hae Choi, Cornelis Erkelens, Alfons W.M. Lefeber, Gerwin Spijksma, Robert van der Heijden, Robert Verpoorte*



Feeding experiments using [1-^{13}C]-D-glucose to *Catharanthus roseus* (L.) G.Don cell suspension cultures were performed in order to study the salicylic acid (SA) biosynthetic pathway and that of 2,3-dihydroxybenzoic acid (2,3-DHBA) as a comparison. Relatively high- and non-symmetrical enrichment ratios at C-2 and C-6, and a lower enrichment ratio at C-7 were observed in both SA and 2,3-DHBA detected by ^{13}C NMR inverse gated spectrometry leading to the conclusion that the isochorismate pathway is responsible for the biosynthesis of both compounds rather than the phenylpropanoid pathway.

ECOLOGICAL BIOCHEMISTRY

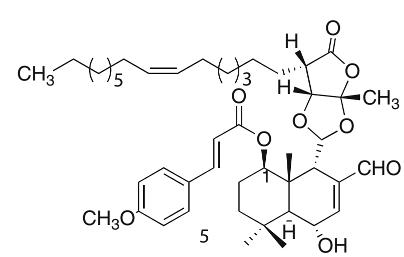
Hiram A. Castillo-Michel, Nubia Zuverza-Mena, Jason G. Parsons, Kenneth M. Dokken, Maria Duarte-Gardea, Jose R. Peralta-Videa, Jorge L. Gardea-Torresdey*



X-ray absorption spectroscopic analyses established partial reduction of arsenate to arsenite in roots and stems of the inbred line "Louis Hamilton" of *Chilopsis linearis*. The reduced fraction was found as an As-$(SX)_3$ species, as confirmed by the As_2S_3 model compound contribution in the X-ray absorption near edge structure (XANES) spectra.

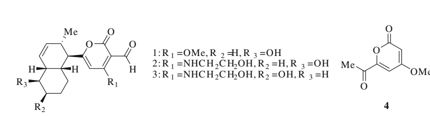
CHEMISTRY

Noureddine Allouche, Cécile Apel, Marie-Thérèse Martin, Vincent Dumontet, Françoise Guéritte, Marc Litaudon*

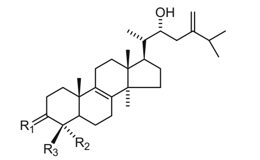


One secobutanolide, 2 butanolides and 6 drimane sesquiterpenoids, along with 6 known drimanes were isolated from *Zygogynum* spp. (Winteraceae). Their structures were elucidated through analysis of spectroscopic data. Compounds with a dialdehyde function exhibited significant inhibitory activities in the *in vitro* cytotoxic assays against KB, HL60 and HCT116 cancer cell lines.

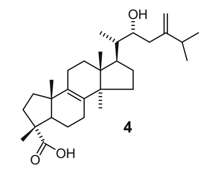
Kongkiat Trisuwan, Vatcharin Rukachaisirikul*, Yaowapa Sukpondma, Sita Preedanon, Souwalak Phongpaichit, Jariya Sakayaroj



Pyrones, named nigrosporapyrones A–D (**1–4**), and five known compounds were isolated from the marine-derived fungus *Nigrospora* PSU-F18. Their structures were elucidated on the basis of spectroscopic evidence. The antibacterial activity against the standard *Staphylococcus aureus* ATCC 25923 and methicillin-resistant *S. aureus* was evaluated.



1 R_1 = O R_2 = R_3 = CH_3
2 R_1 = α-H, β-OH R_2 = COOH R_3 = CH_3
3 R_1 = O R_2 = CH_3 R_3 = H



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* Corresponding author

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