

Komoditas :Vannila Teeal 2006-2008

PLANT GENETICS AND BREEDING (1 JDL)

Natural polyploidy in *Vanilla planifolia* (Orchidaceae)

Genome. 2008. 51 (10). 816-826

Author(s): Bory-Severin. Catrice-Olivie. Brown-Spence. Leitch-Ilia-J. Gigant-Rodolph. Chiroleu-Frederi. Grisoni-Miche. Duval-Marie-Franc. Besse-Pascale. (besse@univ-reunion.fr)

Author Affiliation: Besse, Pascale; Univ La Reunion, UMR PVBMT Cirad, 15 Ave Rene Cassin, BP 7151, F-97715 St Denis 9, Reunion

Abstract: *Vanilla planifolia* accessions cultivated in Reunion Island display important phenotypic variation, but little genetic diversity is demonstrated by AFLP and SSR markers. This study, based on analyses of flow cytometry data, Feulgen microdensitometry data, chromosome counts, and stomatal length measurements, was performed to determine whether polyploidy could be responsible for some of the intraspecific phenotypic variation observed. *Vanilla planifolia* exhibited an important variation in somatic chromosome number in root cells, as well as endoreplication as revealed by flow cytometry. Nevertheless, the 2C-values of the 50 accessions studied segregated into three distinct groups averaging 5.03 pg (for most accessions), 7.67 pg (for the 'Sterile' phenotypes), and 10.00 pg (for the 'Grosse Vanille' phenotypes). For the three groups, chromosome numbers varied from 16 to 32, 16 to 38, and 22 to 54 chromosomes per cell, respectively. The stomatal length showed a significant variation from 37.75 μm to 48.25 μm . Given that 2C-values, mean chromosome numbers, and stomatal lengths were positively correlated and that 'Sterile' and 'Grosse Vanille' accessions were indistinguishable from 'Classique' accessions using molecular markers, the occurrence of recent autotriploid and autotetraploid types in Reunion Island is supported. This is the first report showing evidence of a recent autoploidy in *V. planifolia* contributing to the phenotypic variation observed in this species

Descriptors: Molecular Genetics (Biochemistry and Molecular Biophysics)

PLANT PHYSIOLOGY AND BIOCHEMISTRY (1 JDL)

The relation between glucovanillin, beta -D-glucosidase activity and cellular compartmentation during the senescence, freezing and traditional curing of vanilla beans

Annals of Applied Biology. 2006. 149 (1). 43-52

Author(s): Odoux-E. Escoute-J. Verdeil-J-L

Author Affiliation: Departement Fihor, Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement, TA 50/16, 34398 Montpellier Cedex 5, France

Abstract: The aim of this research was to improve our understanding of the mechanism of glucovanillin hydrolysis by beta -D-glucosidase activity in vanilla beans by studying their senescence, freezing and traditional curing. A batch of green pods from Madagascar was ripened at 30 deg C until fruits turned black; another batch was frozen for few days at -18 deg C and defrosted at 35 deg C for 24 h and a third batch was cured using traditional methods. During treatments, samples were analysed for the yield of glucovanillin hydrolysis, and beta -glucosidase activity was measured. Cellular structures were also examined by light and transmission electron microscopy. Green fruits had a low yield of glucovanillin hydrolysis (<5%), a high level of beta -glucosidase activity (approx equal to 1000 nkatal g-1 fresh weight) and a perfect cellular integrity. Senescent fruits had a high yield of glucovanillin hydrolysis (>95%), no measurable beta -glucosidase activity and complete cellular degradation. Similar results were observed in beans after defrosting. During curing, beans had a medium yield of glucovanillin hydrolysis (<50%), no measurable beta -glucosidase activity and partial cellular degradation compared with senescent or defrosted beans. Results show that the mechanism of glucovanillin hydrolysis in vanilla beans is regulated by cellular compartmentation and that the beta -glucosidase activity level is not the limiting factor for complete hydrolysis. If total decompartmentation is obtained, then complete glucovanillin hydrolysis is observed even if most of the beta -glucosidase activity is lost. The beta -glucosidase activity level only has an effect on glucovanillin hydrolysis kinetics

Descriptors: chemical-composition. enzyme-activity. enzymes. fruits. pods. postharvest-physiology. senescence

PLANT DISEASES (2 JDL)

Identification of potyviruses infecting vanilla by direct sequencing of a short RT-PCR amplicon

Plant Pathology. 2006. 55 (4). 523-529

Author(s): Grisoni-M. Moles-M. Farreyrol-K. Rassaby-L. Davis-R. Pearson-M

Author Affiliation: UMR - Peuplements Vegetaux et Bio-agresseurs en Milieu Tropical, CIRAD/UR, Saint Pierre, 97410, Reunion, France

Abstract: A simple one-tube one-step RT-PCR assay with degenerate primers followed by direct sequencing of a 327 bp coat protein gene fragment was used to identify the potyviruses infecting vanilla. With this technique, unambiguous species allocation was achieved for 34 potyvirus-infected vanilla samples collected in the Indian Ocean and the Pacific areas between 1997 and 2005. Virus identification relied on BLAST homology and nucleotide identities of 162 to 327 nt fragments with known potyvirus sequences. Species allocation was confirmed by neighbour-joining of the 149 nt common to 32 vanilla sequences and 51 known potyviruses. Subject to further identification, these

data revealed four additional Potyvirus species that may infect vanilla: Bean yellow mosaic virus, Cowpea aphid-borne mosaic virus, Ornithogalum mosaic virus and Wisteria vein mosaic virus. The procedure was rapid, cost-effective, easy to use and showed a good taxonomic discriminating value. It also enabled the identification of potyviruses in adjacent weeds and should thus aid the understanding of outbreaks of potyviruses occurring in varied epidemiological circumstances

Descriptors: coat-proteins. databases. genes. molecular-taxonomy. nucleotide-sequences. plant-diseases. plant-pathogens. plant-viruses. polymerase-chain-reaction. taxonomy. techniques. weeds

Fusarium-induced diseases of tropical, perennial crops

Phytopathology. 2006. 96 (6). 648-652

Author(s): Ploetz-R-C

Author Affiliation: Tropical Research & Education Center, Department of Plant Pathology, University of Florida, 18905 SW 280th Street, Homestead, FL 33031, USA

Abstract: This paper describes the symptoms and losses associated with Fusarium-induced diseases of the following tropical, perennial crops: including abaca (*Musa textilis*), banana (*Musa* spp.), cacao (*Theobroma cacao*), passion fruit (*Passiflora* spp.), pineapple (*Ananas comosus*), sugarcane (*Saccharum* spp.) and vanilla (*Vanilla planifolia*)

Descriptors: bananas. cocoa. crop-losses. fungal-diseases. passion-fruits. pineapples. plant-diseases. plant-pathogenic-fungi. plant-pathogens. sugarcane. symptoms. tropical-crops

FOOD PROCESSING (1 JDL)

Dynamic modeling of *Listeria monocytogenes* growth in pasteurized vanilla cream after postprocessing contamination

Journal of Food Protection. 2008. 71 (9). 1828-1834

Author(s): Panagou-Efstathios-Z. (stathispanagou@aua.gr). Nychas-George-John-E

Author Affiliation: Panagou, Efstathios Z. ; Univ Agr, Dept Food Sci and Technol, Lab Microbiol and Biotechnol Foods, Iera Odos 75, Athens 11855, Greece

Abstract: A product-specific model was developed and validated under dynamic temperature conditions for predicting the growth of *Listeria monocytogenes* in pasteurized vanilla cream, a traditional milk-based product. Model performance was also compared with Growth Predictor and Sym'Previous predictive microbiology software packages. Commercially prepared vanilla cream samples were artificially inoculated with a five-strain cocktail of *L. monocytogenes*, with an initial concentration of 10^2 CFU g⁻¹. and stored at 3, 5, 10, and 15 degrees C for 36 days. The growth kinetic parameters at each temperature were determined by the primary model of Baranyi and Roberts. The maximum specific growth rate ($\mu(\max)$) was further modeled as a

function of temperature by means of a square root-type model. The performance of the model in predicting the growth of the pathogen under dynamic temperature conditions was based on two different temperature scenarios with periodic changes from 4 to 15 degrees C. Growth prediction for dynamic temperature profiles was based on the square root model and the differential equations of the Baranyi and Roberts model, which were numerically integrated with respect to time. Model performance was based on the bias factor (B-f), the accuracy factor (A(f)), the goodness-of-fit index (GoF), and the percent relative errors between observed and predicted growth. The product-specific model developed in the present study accurately predicted the growth of *L. monocytogenes* under dynamic temperature conditions. The average values for the performance indices were 1.038, 1.068, and 0.397 for B-f, A(f), and GoF, respectively for both temperature scenarios assayed. Predictions from Growth Predictor and Sym'Previous overestimated pathogen growth. The average values of B-f, A(f), and GoF were 1.173, 1.174, and 1.162, and 1.267, 1.281, and 1.756 from Growth Predictor and Sym'Previous, respectively

Descriptors: **Methods and Techniques; Models and Simulations (Computational Biology); Foods growth kinetic parameter, vanilla cream (dairy product), postprocessing contamination**

FOOD COMPOSITION (3 JDL)

GC-MS and GC-olfactometry analysis of aroma compounds in a representative organic aroma extract from cured vanilla (*Vanilla planifolia* G. Jackson) beans
Food Chemistry. 2006. 99 (4). 728-735

Author(s): Perez-Silva-A. Odoux-E. Brat-P. Ribeyre-F. Rodriguez-Jimenes-G. Robles-Olvera-V. Garcia-Alvarado-M-A. Gunata-Z

Author Affiliation: Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement (CIRAD)TA 50/16, 34398 Montpellier Cedex 5, France

Abstract: Volatile compounds from cured vanilla beans were extracted using organic solvents. Sensory analysis showed that the aromatic extract obtained with a pentane/ether (1/1 v/v) solvent mixture provided the extract most representative of vanilla bean flavour. Sixty-five volatiles were identified in a pentane/ether extract by GC-MS analysis. Aromatic acids, aliphatic acids and phenolic compounds were the major volatiles. By GC-O analysis of the pentane/ether extract, 26 odour-active compounds were detected. The compounds guaiacol, 4-methylguaiacol, acetovanillone and vanillyl alcohol, found at much lower concentrations in vanilla beans than vanillin, proved to be as intense as vanillin

Descriptors: **analytical-methods. aromatic-compounds. GC-MS. phenolic-compounds. sensory-evaluation. vanillin. volatile-compounds**

On-line dilution and detection of vanillin in vanilla extracts obtained by ultrasound

Food Chemistry. 2007. 105 (3). 1201-1208

Author(s): Valdez-Flores-C. Canizares-Macias-M-P

Author Affiliation: Departamento de Quimica Analitica, Facultad de Quimica, Universidad Nacional Autonoma de Mexico (UNAM), Ciudad Universitaria, 04510 Mexico, DF, Mexico

Abstract: A continuous flow method coupling the dilution of extracts, obtained by application of ultrasound, and the on-line detection of vanillin is proposed. The flow method allowed the quantification of vanillin in a range between 200 mg l⁻¹ and 2000 mg l⁻¹ with a repeatability and reproducibility of 3.79% and 3.03%, respectively, for a standard of 1200 mg l⁻¹. The extraction conditions such as irradiation power, irradiation time, non-irradiation time and number of cycles are some of the most significant conditions in the vanilla extraction by ultrasound assisted extraction (USAE). The obtained results were compared with other conventional extraction methods: Soxhlet and maceration in accordance with the Mexican official method. The results showed that with the application of the USAE the extraction efficiency was increased between 19% and 72% in comparison with Soxhlet and maceration, respectively, besides, the extraction time decreased between 83% and 98%

Descriptors: detection. extraction. extracts. flavour-compounds. methodology. ultrasound. vanillin

A simple and rapid HPLC technique for vanillin determination in alcohol extract

Food Chemistry. 2007. 101 (3). 1059-1062

Author(s): Waliszewski-K-N. Pardo-V-T. Ovando-S-L

Author Affiliation: Instituto Tecnológico de Veracruz, Unidad de Investigación y Desarrollo en Alimentos, M.A. de Quevedo 2779, P.O. Box 1380, 91700 Veracruz, Mexico

Abstract: This paper describes a simple and rapid HPLC technique for vanillin determination in alcohol vanilla extract. Vanillin was separated on a Nucleosil C18 column by using water and methanol (40:60) as the mobile phase and retention time was only 2.2 min. The measurements were made by using a photodiode array detector of the most adequate maximum wavelength absorbance at 231 nm. This method has been successfully applied for the determination of vanillin in some commercial extracts

Descriptors: analytical-methods. extracts. HPLC. quantitative-analysis. vanillin