

## Komoditas : KOPI

1. Title:Shade effect on coffee production at the northern Tzeltal zone of the state of Chiapas, Mexico

View Article: Agriculture, Ecosystems & Environment. 2000. 80 (1/2). 61-69  
CD Volume:325

Print Article: Pages: 61-69

Author(s):Soto Pinto L Perfecto I Castillo Hernandez J Caballero Nieto J

Author Affiliation:El Colegio de la Frontera Sur, Apartado Postal 63, San Cristobal, Chiapas 29200, Mexico

Language:English

Abstract:An on-farm research project was conducted in the municipality of Chilon, Chiapas, Mexico, with the objectives of investigating the effect of shade structure on coffee grain yield and assessing the potential uses of associated plant species. Results showed that shade cover percentage and coffee shrub density had significant effects on yields. Maintaining coffee shrub density as a constant, a regression equation related yield to percentage shade by a quadratic polynomial. Coffee density had significant effect on yields but shade tree density had no effect. Coffee cultivar, age of coffee stand, species richness, shade tree density, basal area, slope and aspect did not have significant effects on coffee yields. Shade tree cover of 23-38% had a positive effect on yield. Production may decrease under shade cover of >50%. A total of 61 shade species were found, with an average density of 260 trees/ha, the majority of them being indigenous species, used as food, construction materials and as firewood. The role of ecological features associated with shade on yields and availability of natural resources obtained from coffee systems are discussed

Descriptors:coffee. basal-area. fuelwood. grain. natural-resources. shade-trees. species-diversity. agroforestry. intercropping. multipurpose-trees. agrosilvicultural-systems. stimulant-plants

Geographic Locator:Mexico

Organism Descriptors:Coffea

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants. North-America. America. Developing-Countries.

Threshold-Countries. Latin-America. OECD-Countries

Subject Codes:FF003. FF100. FF900. QQ050. KK600

Supplementary Info:35 ref

ISSN:0167-8809

Year:2000

Journal Title:Agriculture, Ecosystems & Environment

Copyright:Copyright CAB International

2. Title:Survival and growth of rattan intercropped with coffee and cacao in the agroforests of Indonesia

View Article: Agroforestry Systems. 2000. 50 (1). 95-102

CD Volume:309

Print Article: Pages: 95-102

Author(s):Siebert S F

Author Affiliation:School of Forestry, University of Montana, Missoula, MT 59812, USA

Language:English

Abstract:The intercropping of *Calamus zollingeri*, a large-diameter rattan used in furniture making, was investigated in coffee and cacao agroforests in Sulawesi, Indonesia. The first part of the study investigated the viability of producing seedlings from seeds and vegetative cuttings of *Calamus zollingeri*, and initial seedling survival, growth and response to light and soil drainage in village nurseries and perennial farms. Over 96% of seeds and 61% of vegetative cuttings were raised to transplanting size (25 cm with 2-3 three leaves) over 20 months. One hundred *C. zollingeri* seedlings produced from cuttings were transplanted into each of 3 coffee or cacao farms and one primary forest site. They exhibited an overall survival rate of 96%, 12.7 cm of height growth and the

production of 0.8 new leaves per plant after 8 months. No significant differences were observed between the 4 sites with respect to seedling survival, growth, or leaf production. Light intensity was only weakly related to seedling growth and new leaf production (based on multiple PAR measurements). However, poorly drained sites exhibited significantly reduced *C. zollingeri* seedling survival and growth. It is concluded that the cultivation of *C. zollingeri* in coffee and cacao agroforests represents a potential means of intensifying and diversifying perennial cash crop farming systems

Descriptors:coffee. shoot-cuttings. vegetative-propagation. stecklings. seedlings. planting-stock. drainage. agroforestry-systems. cropping-systems. agrosilvicultural-systems. intercropping. light-intensity. seeds. survival. transplanting. canes-and-rattans. cocoa. virgin-forests. tropical-forests. seedling-growth

Geographic Locator:Indonesia. Sulawesi

Identifiers:Calamus zollingeri. primary forests

Organism Descriptors:Theobroma-cacao. Coffea-canephora. Calamus. Coffea

Supplemental Descriptors:Theobroma. Sterculiaceae. Malvales. dicotyledons.

angiosperms. Spermatophyta. plants. Coffea. Rubiaceae. Rubiales. Areaceae.

Arecales. monocotyledons. South-East-Asia. Asia. Developing-Countries. ASEAN-Countries. Indonesia. Calamus

Subject Codes:KK600. FF150. FF003. FF100. JJ300. PP500. FF160. KK110

Supplementary Info:16 ref

ISSN:0167-4366

Year:2000

Journal Title:Agroforestry Systems

Copyright:Copyright CAB International

3. Title:Efficacy testing of coffee parchments demucilaging cum-washing machines

View Article: AMA, Agricultural Mechanization in Asia, Africa and Latin America. 2000. 31 (3). 38-42

CD Volume:297

Print Article: Pages: 38-42

Author(s):Madasamy M Visvanathan R Kailappan R

Author Affiliation:Department of Agricultural Processing, College of Agricultural Engineering, Tamil Nadu Agricultural University, Coimbatore 641 003, India

Language:English

Abstract:Two models of demucilaging cum washing mechanisms, namely; auger type and brush type were developed and evaluated with Arabica and Robusta parchments. In the auger type, the highest washing efficiencies of 84.9 and 95.3% were achieved for Arabica and Robusta, respectively, at 40 rpm auger speed, 200 kg/hr feed rate and 0.44 l/s water flow rate. The highest washing efficiencies of 100 and 85.7% for Arabica and Robusta, respectively, were achieved with the brush type at 620 rpm, 25 kg/hr and 0.03 l/s brush speed, feed rate and water flow rate, respectively

Descriptors:coffee. cleaners. washers. washing. water-flow. testing

Organism Descriptors:Coffea

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants

Subject Codes:NN460. QQ050. QQ100. FF003

Supplementary Info:13 ref

ISSN:0084-5841

Year:2000

Journal Title:AMA, Agricultural Mechanization in Asia, Africa and Latin America

Copyright:Copyright CAB International

4. Title:The carboxyl terminus of coffee bean alpha-galactosidase is critical for enzyme activity

View Article: Arch Biochem Biophys 2000 Jan 1;373(1):225-30

CD Volume:332

Print Article: Pages: 225-230

Author(s):Maranville E Zhu A

Author Affiliation:Lindsley F. Kimball Research Institute of the New York Blood Center, 310 East 67th Street, New York, New York, 10021, USA

Abstract:The role of the carboxyl (C)-terminal region of coffee bean alpha-galactosidase (alpha-GAL) has been studied by expressing C-terminal deletion mutants in the methylotrophic yeast strain *Pichia pastoris*. A previous study of human alpha-galactosidase determined that enzyme activity increased when up to 10 amino acid residues were deleted. Deleting 11 residues reduced activity, and deleting 12 residues abolished activity. In our studies, alpha-GAL activity is reduced when one or two amino acids are deleted, as is enzyme secretion directed by *P. pastoris* signal sequences. The pH profile is similar to that of the wild-type enzyme. Deleting 3 or more residues from the C-terminal end results in a complete loss of both enzyme secretion and activity. The C-terminus of alpha-GAL seems to play an important role in overall enzyme conformation and may directly affect the proper conformation of the active site

Descriptors:Amino Acid Sequence. Base Sequence. Catalytic Domain. Coffee. DNA, Complementary. Human. Hydrogen-Ion Concentration. In Vitro. Kinetics. Molecular Sequence Data. *Pichia*. Recombinant Proteins. Sequence Deletion. Sequence Homology, Amino Acid. Sequence Homology, Nucleic Acid. Support, U.S. Gov't, P.H.S.. alpha-Galactosidase

Geographic Locator:UNITED STATES

ISSN:0003-9861

Year:2000

Journal Title:Archives of Biochemistry and Biophysics

5. Title:Rhizosphere pH evaluation of coffee genotypes in response to soil aluminium toxicity

View Article: [Bragantia. 2000. 59 \(1\). 83-88](#)

CD Volume:333

Print Article: Pages: 83-88

Author(s):Braccini M D C L Martinez H E P Braccini A de L Mendonca S M de

Author Variant:de-L-Braccini-A. de-Mendonca-S-M

Author Affiliation:Centro de Ciencias Agrarias, Universidade Estadual do Oeste do Parana, Rua Pernambuco, 1.777, 85960-000 Marechal Candido Rondon, PR, Brazil

Other Title:Avaliacao do pH da rizosfera de genotipos de cafe em resposta a toxidez de aluminio no solo

Language:Portuguese

Language of Summary:english

Abstract:This work was carried out under greenhouse conditions in order to evaluate the relationship between rhizosphere-pH and aluminium tolerance of five coffee genotypes, grown with or without soil liming. Coffee plants were grown in plastic boxes, with roots developing near the cover. After 90 days the lids were removed and a solid agar layer with pH indicator was placed on the surface of soil and roots. Roots and shoots dry biomass production and roots length and surface were evaluated. When the soil was limed, the development of yellow colouring near the roots indicating a pH decrease was observed. This result was confirmed by observing soil and rhizosphere-pH changes, varying between 0.2 and 0.3 units of pH. In the presence of Al, differences among soil and rhizosphere-pH were not observed, indicating that the change of pH induced by roots is not the mechanism of Al tolerance in coffee plants, since sensible and tolerant genotypes showed the same behaviour

Descriptors:aluminium. coffee. genotypes. toxicity. biomass-production. liming. roots. shoots. tolerance. rhizosphere. soil-pH. soil-chemistry. crop-production. soil-pollution. contamination

Organism Descriptors:Coffea

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants

Subject Codes:JJ200. JJ100. PP600. FF100. FF900. FF003

Supplementary Info:15 ref

ISSN:0006-8705

Year:2000

Journal Title:Bragantia  
Copyright:Copyright CAB International

6. Title:A review of the biology and control of the coffee berry borer,  
*Hypothenemus hampei* (Coleoptera: Scolytidae)

View Article: Bulletin of Entomological Research. 2000. 90 (6). 453-465  
CD Volume:299

Print Article: Pages: 453-465

Author(s):Damon A

Author Affiliation:El Colegio de la Frontera Sur, Apdo. Postal 36, Tapachula,  
Chiapas, Mexico

Language:English

Abstract:The coffee berry borer, *Hypothenemus hampei* Ferrari, is a serious problem for the majority of the world's coffee growers and has proved to be one of the most intractable of present day pests. Despite a great deal of research, control still depends largely on the application of the organochlorine insecticide endosulfan, which is damaging to the environment, or a series of cultural and biological control methods which give variable and unpredictable results. This review summarizes the most important aspects of the biology and ecology of *H. hampei* and its control and identifies weak points in the knowledge about this pest. Emphasis is placed upon an analysis of the non-chemical control methods available and suggestions are offered for novel ecological and environmental factors worthy of further research, in the search for viable and sustainable control methods

Descriptors:insect-control. insect-pests. plant-pests. coffee. endosulfan.  
biological-control. chemical-control. cultural-control

Organism Descriptors:Hypothenemus-hampeii. Coffea. insects

Supplemental Descriptors:Hypothenemus. Scolytidae. Coleoptera. insects.  
arthropods. invertebrates. animals. Rubiaceae. Rubiales. dicotyledons.  
angiosperms. Spermatophyta. plants

Subject Codes:FF620. FF003. HH400. HH100. HH200

Supplementary Info:Many ref

ISSN:0007-4853

Year:2000

Journal Title:Bulletin of Entomological Research

Copyright:Copyright CAB International

7. Title:Parasitoids of medfly, *Ceratitidis capitata*, and related tephritids in  
Kenyan coffee: a predominantly koinobiont assemblage

View Article: Bulletin of Entomological Research. 2000. 90 (6). 517-526

CD Volume:299

Print Article: Pages: 517-526

Author(s):Wharton R A Trostle M K Messing R H Copeland R S Kimani Njogu S W Lux  
S Overholt W A Mohamed S Sivinski J

Author Affiliation:Department of Entomology, Texas A&M University, College  
Station, TX 77843, USA

Language:English

Abstract:Arabica coffee was sampled from two sites in the central highlands of Kenya (Rurima, Ruiru) and one site on the western side of the Rift Valley (Koru). Three species of ceratitidine Tephritidae, *Ceratitidis capitata* (Wiedemann), *C. rosa* Karsch and *Trirhithrum coffeae* Bezzi, were reared from sites in the central highlands, and an additional species, *C. anonae* Graham, was recovered from the western-most site. Ten species of parasitic Hymenoptera were reared from these tephritids. The parasitoid assemblage was dominated by koinobionts. Eight of the species are koinobiont endoparasitoids, but only one idiobiont larval ectoparasitoid was reared, and only one idiobiont pupal endoparasitoid. The effects of sampling bias on determination of parasitoid assemblage size associated with concealed hosts are discussed. The potential for use of these parasitoids in biological control is also discussed. Most of the parasitoid species recovered during this study are capable of developing on *C.*

capitata, while several also attack *C. rosa*. Both flies are notorious pests of tropical and subtropical fruits  
Descriptors:parasitoids. biological-control. insect-pests. plant-pests. coffee  
Geographic Locator:Kenya  
Identifiers:Trirhithrum coffeae. Ceratitis anonae. Trirhithrum  
Organism Descriptors:Ceratitis-capitata. Ceratitis-rosa. Coffea. Hymenoptera. insects  
Supplemental Descriptors:East-Africa. Africa-South-of-Sahara. Africa. Developing-Countries. ACP-Countries. Commonwealth-of-Nations. Anglophone-Africa. Ceratitis. Tephritidae. Diptera. insects. arthropods. invertebrates. animals. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes:FF620. HH100. YY700. FF003  
Supplementary Info:62 ref  
ISSN:0007-4853  
Year:2000  
Journal Title:Bulletin of Entomological Research  
Copyright:Copyright CAB International

8. Title:Genetic study of *Coffea canephora* coffee tree resistance to *Meloidogyne incognita* nematodes in Guatemala and *Meloidogyne* sp. nematodes in El Salvador for selection of rootstock varieties in Central America

View Article: Euphytica. 113 (2). 2000. 79-86

CD Volume:310

Print Article: Pages: 79-86

Author(s):Bertrand B Pena Duran M X Anzueto F Cilas C Etienne H Anthony F Eskes A B

Author Affiliation:IICA/CIRAD, 2200, Coronado

Language:English

Language of Summary:English (EN)

Abstract:Root-knot nematodes, *Meloidogyne incognita* in Guatemala and *Meloidogyne* sp. in El Salvador frequently cause very serious damage to *Coffea arabica*.

Hypocotyledon grafting on *C. canephora* var. *Robusta* is practiced on a very wide scale to control these pests. However, rootstock seeds come from non selected trees which provide 30-40% resistance. In this article, we examine the possibility of improving resistance to *M. incognita* and *Meloidogyne* sp. Hybrids were created using two North Carolina II factorial mating designs and tested under controlled conditions for resistance to isolates of the two nematodes. In the trial with *Meloidogyne* sp. the number of nematodes per plant was counted, and in the trial with *M. incognita* a root damage index was established.

Vegetative measurements (height, weight of aerial parts and roots) were taken in both trials. The parents were classed according to their cross value and genetic variance was estimated. In the factorial trial conducted with the *Meloidogyne* sp. isolate from El Salvador, parents T3561 and T3751 transmitted high resistance levels of 56 and 54%, respectively, to their progenies, as opposed to 9% for the other parents. The cross between those two parents achieved 78% resistant plants. In the trial with the *M. incognita* isolate from Guatemala, similar results were found. The same two parents transmitted resistance to 64% of their progenies, as opposed to 36% for the other parents. Classification of the parents did not differ from one trial to the other. The existence of a complex nematode resistance locus in the *C. canephora* species seems highly likely. The results show that it is possible to select rootstock varieties that are more resistant to the main *Meloidogyne* nematodes in Guatemala and El Salvador. Given the average heritability values (0.28-0.30) and the possibility of applying strong selection intensity, the genetic progress expected in the next selection cycle should be substantial

Descriptors:pest resistance; plant breeding; rootstock selection. Horticulture (Agriculture); Infection; Pest Assessment Control and Management

Geographic Locator:Central America (Neotropical region); El Salvador (Central America, Neotropical region); Guatemala (Central America, Neotropical region)

Organism Descriptors:Coffea canephora [coffee tree] (Rubiaceae): host;  
Meloidogyne incognita (Nematoda): phytoparasite; Meloidogyne sp. (Nematoda):  
phytoparasite  
Supplemental Descriptors:Nematoda: Aschelminthes, Helminthes, Invertebrata,  
Animalia; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae.  
Angiosperms; Animals; Aschelminths; Dicots; Helminths; Invertebrates; Plants;  
Spermatophytes; Vascular Plants  
Subject Codes:Horticulture (Agriculture); Infection; Pest Assessment Control and  
Management  
ISSN:0014-2336  
Year:2000  
Journal Title:Euphytica  
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9. Title:Investigations of peptides and proteases in green coffee beans  
View Article: European Food Research and Technology. 211 (2). 2000. 111-116  
CD Volume:335

Print Article: Pages: 111-116

Author(s):Ludwig Eberhard Lipke Uwe Raczek Ulrike Jaeger Anne

Author Affiliation:Dresden University of Technology, Institute of Food  
Chemistry, D-01062, Dresden

Language:English

Language of Summary:English (EN)

Abstract:The isolation and cleaning of peptides from green coffee beans are  
described. The peptide contents, the two-dimensional electrophoresis pattern and  
the overall amino acid composition were determined using five samples of Coffea  
arabica and four samples of Cof. canephora var. robusta. The coffee types were  
not significantly different in peptide content, but were significantly different  
in peptide composition. Peptides with weakly acid pI values were mainly found in  
the Cof. robusta samples. In comparison, peptides from Cof. arabica samples  
ranged evenly from the weakly acidic up to the weakly basic pH range. The  
apparent molecular masses of the peptides in the two groups of samples lie  
between 4 kDa and 10 kDa. The cysteine content of the peptides was relatively  
high. Model roastings permitted the assumption that peptides make a contribution  
to coffee flavour. Peptides are already available in freshly harvested coffee.  
Model tests have suggested that processing after the coffee harvest has an  
influence on peptide composition but not on the amounts of peptide. All coffee  
samples contained some extractable proteases. The electrophoretically obtained  
enzyme patterns of Cof. arabica and Cof. robusta were different

Descriptors:coffee powder; green coffee beans. Foods. endopeptidases;  
peptides; proteases

Organism Descriptors:Coffea arabica (Rubiaceae); Coffea canephora robusta  
(Rubiaceae)

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta,  
Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods

ISSN:1438-2377

Year:2000

Journal Title:European Food Research and Technology

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10. Title:Sensory study of the character impact aroma compounds of a coffee  
beverage

View Article: European Food Research and Technology. 211 (4). 2000. 272-276  
CD Volume:335

Print Article: Pages: 272-276

Author(s):Mayer Florian Czerny Michael Grosch Werner

Author Affiliation:Deutsche Forschungsanstalt fuer Lebensmittelchemie,  
Lichtenbergstrasse 4, 85748, Garching

Language:English

Language of Summary:English (EN)

Abstract: The more potent odorants in a sample of medium-roasted Arabica coffee and in the corresponding brew were quantified. Large amounts (> 75 %) of acetaldehyde, 2,3-butanedione, 2,3-pentanedione, vanillin and some furanones were extracted from the coffee brew, whereas the yields of the more unpolar compounds, such as 3-isobutyl-2-methoxypyrazine, (E)-beta-damascenone and the unstable 2-furfurylthiol were low (< 25 %). On the basis of quantitative data an aroma model was prepared for the brew. In triangle tests, models containing the complete set of 24 odorants were compared with a model missing one or more odorants. These experiments indicated that the aroma of the brew was mainly caused by some alkyipyrazines, furanones and phenols, and by 2-furfurylthiol, methional and 3-mercapto-3-methylbutyl formate. The higher impact of both methional and the formate on the aroma of the brew and the lower aroma activity of 4-vinylguaiacol were in contrast to results obtained in a previous study for ground coffee of the same provenance and roast degree

Descriptors: Arabica coffee powder: coffee, medium-roasted, odor profile, odorant concentration; aroma model; brewed coffee: coffee, medium-roasted, odor profile, odorant concentration. Foods. coffee aroma compounds: quantification

Organism Descriptors: Coffea arabica (Rubiaceae)

Supplemental Descriptors: Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes: Foods

ISSN: 1438-2377

Year: 2000

Journal Title: European Food Research and Technology

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11. Title: Formation of aliphatic acids by carbohydrate degradation during roasting of coffee

View Article: European Food Research and Technology. 211 (6). 2000. 404-410  
CD Volume: 335

Print Article: Pages: 404-410

Author(s): Ginz Michael Balzer Hartmut H Bradbury Allan G W Maier Hans G

Author Affiliation: Kraft Foods Research and Development Inc., Unterbiberberger-Strasse 15, 81737, Munich: ABRADBUR@krafteurope.com

Language: English

Language of Summary: English (EN)

Abstract: A major fraction of the acidity generated on coffee roasting can be attributed to formation of the four aliphatic acids formic, acetic, glycolic and lactic. Addition of sucrose, glucose or fructose to green coffee beans gave, compared to untreated beans, significant increases in the yields of the four acids on subsequent roasting. In addition, model studies using these three carbohydrates confirmed sucrose as the principal green bean precursor of the acids. Arabinose, erythrose and 1,6-anhydroglucose were identified as reaction products of sucrose thermal degradation and also subsequently served as precursors for acid formation. Isotopic labelling experiments indicated that known degradation pathways could be used to explain the formation of the four aliphatic acids from sucrose

Descriptors: coffee: beverage. Biochemistry and Molecular Biophysics; Foods. 1,6-anhydroglucose; acetic acid: formation; aliphatic acids: formation; arabinose; erythrose; formic acid: formation; fructose; glucose; glycolic acid: formation; lactic acid: formation; sucrose: thermal degradation

Subject Codes: Biochemistry and Molecular Biophysics; Foods

ISSN: 1438-2377

Year: 2000

Journal Title: European Food Research and Technology

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12. Title: Incomplete transmission of coffee bean prices: evidence from The Netherlands

View Article: European Review of Agricultural Economics. 2000. 27 (1). 1-16  
CD Volume: 325

Print Article: Pages: 1-16

Author(s): Bettendorf L Verboven F

Author Affiliation: OCFEB, Erasmus University Rotterdam, Netherlands

Language: English

Abstract: This paper explains the incomplete transmission of coffee bean prices to consumer prices. An aggregate model of oligopolistic interaction is used and demand and cost parameter estimates consistent with conventional wisdom in the industry are obtained. Conduct is estimated to be relatively competitive. Results imply that the relatively large share of costs other than bean costs accounts for the greater part of the incomplete price transmission. The remaining part is due to mark-up absorption, but is less important as oligopolistic interdependence is relatively competitive

Descriptors: coffee. market-prices. producer-prices. consumer-prices. models. imperfect-competition. market-competition. retail-marketing. production-costs. coffee-industry

Geographic Locator: Netherlands

Organism Descriptors: Coffea

Supplemental Descriptors: Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants. Western-Europe. Europe. Developed-Countries. Benelux.

European-Union-Countries. OECD-Countries

Subject Codes: QQ050. EE130. EE110. EE111

Supplementary Info: 22 ref

ISSN: 0165-1587

Year: 2000

Journal Title: European Review of Agricultural Economics

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13. Title: Potent odorants of raw Arabica coffee. Their changes during roasting  
View Article: Journal of Agricultural and Food Chemistry. 48 (3). March, 2000. 868-872

CD Volume: 301

Print Article: Pages: 868-872

Author(s): Czerny Michael Grosch Werner

Author Affiliation: Deutsche Forschungsanstalt fuer Lebensmittelchemie, Lichtenbergstrasse 4, D-85748, Garching

Language: English

Language of Summary: English (EN)

Abstract: Aroma extract dilution analysis of raw Arabica coffee revealed 3-isobutyl-2-methoxypyrazine (I), 2-methoxy-3,5-dimethylpyrazine (II), ethyl 2-methylbutyrate (III), ethyl 3-methylbutyrate (IV), and 3-isopropyl-2-methoxypyrazine (V) as potent odorants. The highest odor activity value was found for I followed by II, IV, and V. It was concluded that I was responsible for the characteristic, peasy odor note of raw coffee. Twelve odorants occurring in raw coffee and (E)-beta-damascenone were also quantified after roasting. The concentration of I did not change, whereas methional, 3-hydroxy-4,5-dimethyl-2(5H)-furanone, vanillin, (E)-beta-damascenone, and 4-vinyl- and 4-ethylguaiacol increased strongly during the roasting process

Descriptors: raw Arabica coffee: roasting effect. Biochemistry and Molecular Biophysics; Foods. (E)-beta-damascenone; 2-methoxy-3,5-dimethylpyrazine; 3-hydroxy-4,5-dimethyl-2(5H)-furanone; 3-isobutyl-2-methoxypyrazine; 3-isopropyl-2-methoxypyrazine; 4-ethylguaiacol; 4-vinylguaiacol; ethyl 2-methylbutyrate; ethyl 3-methylbutyrate; methional; odorant: potency; vanillin

Subject Codes: Biochemistry and Molecular Biophysics; Foods

ISSN: 0021-8561

Year: 2000

Journal Title: Journal of Agricultural and Food Chemistry

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14. Title: Development of ochratoxin A during Robusta (Coffea canephora) coffee cherry drying



View Article: Journal of Agricultural and Food Chemistry. 48 (4). April, 2000. 1358-1362

CD Volume:301

Print Article: Pages: 1358-1362

Author(s):Bucheli Peter Kanchanomai Chaorai Meyer Inge Pittet Alain

Author Affiliation:Nestle Research Center, 101 Av. Gustave Eiffel, F-37390, Notre Dame d'Oe

Language:English

Language of Summary:English (EN)

Abstract:The occurrence and formation of ochratoxin A (OTA) in Robusta coffee was studied for three consecutive seasons under tropical conditions in Thailand. Sun drying of coffee cherries consistently led to OTA formation in the pulp and parchment (husks) of the cherries. In replicated trials, dried coffee beans (green coffee) were shown to contain on average OTA concentrations that were approx 1% of those found in husks. OTA contamination of green coffee depended on cherry maturity, with green cherries being the least, and overripe cherries the most susceptible. Defects, and in particular the inclusion of husks, are the most important source of OTA contamination. OTA contamination occurred independently of whether cherries were placed on concrete, on bamboo tables, or on the ground. The study suggests that better raw material quality, an appropriate drying and dehulling procedure combined with a reduction of green coffee defects can effectively contribute to the reduction of OTA in green coffee

Descriptors:Foods; Toxicology. ochratoxin A: toxin

Organism Descriptors:Coffea canephora [robusta coffee] (Rubiaceae); mold (Fungi): contaminant

Supplemental Descriptors:Fungi: Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods; Toxicology

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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15. Title:In vitro antioxidant and ex vivo protective activities of green and roasted coffee

View Article: Journal of Agricultural and Food Chemistry. 48 (5). May, 2000. 1449- 1454

CD Volume:301

Print Article: Pages: 1449-1454

Author(s):Daglia Mari Papetti Adele Gregotti Cesarin Berte Francantonio Gazzani Gabriell

Author Affiliation:Department of Pharmaceutical Chemistry, Faculty of Pharmacy, University of Pavia, Via Taramelli 12, 27100, Pavia

Language:English

Language of Summary:English (EN)

Abstract:The antioxidant properties of green and roasted coffee, in relation to species (*Coffea arabica* and *Coffea robusta*) and degree of roasting (light, medium, dark), were investigated. These properties were evaluated by determining the reducing substances (RS) of coffee and its antioxidant activity (AA) in vitro (model system beta-carotene-linoleic acid) and ex vivo as protective activity (PA) against rat liver cell microsome lipid peroxidation measured as TBA-reacting substances. RS of *C. robusta* samples were found to be significantly higher when compared to those of *C. arabica* samples ( $p < 0.001$ ). AA for green coffee samples were slightly higher than for the corresponding roasted samples while PA was significantly lower in green coffee compared to that of all roasted samples ( $p < 0.001$ ). Extraction with three different organic solvents (ethyl acetate, ethyl ether, and dichloromethane) showed that the most protective compounds are extracted from acidified dark roasted coffee solutions with ethyl acetate. The analysis of acidic extract by gel filtration chromatography (GFC)

gave five fractions. Higher molecular mass fractions were found to possess antioxidant activity while the lower molecular mass fractions showed protective activity. The small amounts of these acidic, low molecular mass protective fractions isolated indicate that they contain very strong protective agents  
Descriptors:green coffee; roasted coffee; roasting darkness. Foods.

antioxidants; lipid: peroxidation

Organism Descriptors:Coffea arabica (Rubiaceae); Coffea robusta (Rubiaceae)

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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16. Title:A powerful aromatic volatile thiol, 2-furanmethanethiol, exhibiting roast coffee aroma in wines made from several Vitis vinifera grape varieties

View Article: Journal of Agricultural and Food Chemistry. 48 (5). May, 2000.

1799- 1802

CD Volume:301

Print Article: Pages: 1799-1802

Author(s):Tominaga Takatoshi Blanchard Louis Darriet Philippe Dubourdieu Denis

Author Affiliation:Faculte d'Oenologie, Universite Victor Segalen Bordeaux 2, 351 Cours de la Liberation, 33405, Talence

Language:English

Language of Summary:English (EN)

Abstract:The chemical compound 2-furanmethanethiol (2FM), with a strong roast coffee aroma, has been identified in sweet white wines made from the Petit manseng grape variety, and in certain red Bordeaux wines (made from the Merlot, Cabernet franc, and Cabernet sauvignon grape varieties). This was done by extracting specific volatile thiols using p-hydroxymercuribenzoate. The 2FM has also been found in toasted oak used in barrel-making. All the Petit manseng sweet white wines and some of the red Bordeaux wines analyzed contained between a few ng/L and several dozen ng/L of 2FM. Taking into account its very low perception threshold (0.4 ng/L in a model hydro alcoholic environment), 2FM could therefore contribute to the roast coffee aroma of certain wines

Descriptors:red Bordeaux wine: aroma. Foods. 2-furanmethanethiol: aromatic volatile, roast coffee aroma, thiol

Organism Descriptors:Vitis vinifera [grape] (Vitaceae): cultivar-Cabernet franc, cultivar-Cabernet sauvignon, cultivar-Merlot, cultivar-Petit manseng

Supplemental Descriptors:Vitaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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17. Title:Discriminate analysis of roasted coffee varieties for trigonelline, nicotinic acid, and caffeine content

View Article: Journal of Agricultural and Food Chemistry. 48 (8). August, 2000.

3420-3424

CD Volume:302

Print Article: Pages: 3420-3424

Author(s):Casal S Oliveira M B P P Alves M R Ferreira M A

Author Affiliation:CEQUP/Service de Bromatologia, Faculdade de Farmacia, Universidade do Porto, Rua Anibal Cunha 164, 4050-047, Porto

Language:English

Language of Summary:English (EN)

Abstract:Arabica and robusta roasted coffees from several geographical origins, in a total of 29 samples, were characterized for their contents in caffeine,

trigonelline, and nicotinic acid by a recently developed HPLC/diode-array detector method. All samples were subjected to the same roasting procedure in order to eliminate the variations due to this process. Characterization was achieved by applying multivariate and nonparametric analysis to the chromatographic results. The two coffee varieties were clearly separated by their trigonelline and caffeine contents. Nicotinic acid could not be used as a variety discriminate factor. There was no association with the geographical origin of the samples

Descriptors:food chemistry; geographic origin; roasted coffee: beverage; species origin; varietal origin. Horticulture (Agriculture); Biochemistry and Molecular Biophysics; Foods; Systematics and Taxonomy. caffeine; nicotinic acid; trigonelline

Organism Descriptors:Coffea arabica [arabica coffee] (Rubiaceae): plantation crop; Coffea canephora [robusta coffee] (Rubiaceae): plantation crop

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Biochemistry and Molecular Biophysics; Foods; Systematics and Taxonomy

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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18. Title:Identification of proline-based diketopiperazines in roasted coffee  
View Article: Journal of Agricultural and Food Chemistry. 48 (8). August, 2000. 3528-3532

CD Volume:302

Print Article: Pages: 3528-3532

Author(s):Ginz Michael Engelhardt Ulrich H

Author Affiliation:Institut fuer Lebensmittelchemie, Technische Universitaet Braunschweig, Schleinitzstrasse 20, DE-38106, Braunschweig

Language:English

Language of Summary:English (EN)

Abstract:Five proline-based diketopiperazines were identified in water extracts of roasted coffee proteins and roasted coffee itself. These are cyclo(pro-ile), cyclo(pro-leu), cyclo(pro-phe), cyclo(pro-pro), and cyclo(pro-val). The isolation included gel chromatography and solvent (CHCl<sub>3</sub>) extraction; in the case of roasted coffee brews, polyamide column chromatography was also used. The identification was achieved by LC-ESI-MS and -MS/MS by comparison of the retention time and the fragmentation pattern with reference compounds. As a second method GC-EI-MS was used. By both methods the presence of diketopiperazines in roasted coffee was unambiguously verified

Descriptors:food chemistry; roasted coffee: beverage. Foods. proline-based diketopiperazine: identification

Subject Codes:Foods

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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19. Title:Screening on the occurrence of ochratoxin A in green coffee beans of different origins and types

View Article: Journal of Agricultural and Food Chemistry. 48 (8). August, 2000. 3616-3619

CD Volume:302

Print Article: Pages: 3616-3619

Author(s):Romani Santina Sacchetti Giampiero Lopez Clemencia Chaves Pinnavaia Gian Gaetano Rosa Marco Dalla

Author Affiliation:Dipartimento di Protezione e Valorizzazione Agro-Alimentare, Sezione di Chimica e Tecnologia degli Alimenti, Universita degli Studi di Bologna, Via S. Giacomo 7, 40126, Bologna

Language:English

Language of Summary:English (EN)

Abstract:Since to our knowledge no data are available in the literature regarding the influence of green coffee type and origin on ochratoxin A (OTA) content, determinations were carried out in order to assess the level of OTA contamination in green coffee samples of different provenience. A total of 162 samples of green coffee beans from various countries (84 from Africa, 60 from America, and 18 from Asia) were analyzed for OTA. Both the amount and the variability of OTA levels were tested as a function of green coffee provenience. The results showed that 106 of the overall samples were positive for OTA, with concentration ranging from 0 to 48 mug/kg (ppb). In particular, it was possible to verify that African samples were more contaminated with respect to samples of other origin in terms of frequency and level of OTA; the highest concentrations observed were 18 and 48 mug/kg in two samples from The Congo

Descriptors:contamination source; food chemistry; green coffee beans: country of origin. Horticulture (Agriculture); Foods; Toxicology. ochratoxin A: toxin

Geographic Locator:Africa (Ethiopian region); America (Unclassified); Asia (Palearctic region); Congo (Ethiopian region)

Organism Descriptors:coffee (Rubiaceae)

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Foods; Toxicology

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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20. Title:Antioxidative activities of heterocyclic compounds formed in brewed coffee

View Article: Journal of Agricultural and Food Chemistry. 48 (11). November, 2000. 5600-5603

CD Volume:302

Print Article: Pages: 5600-5603

Author(s):Fuster Marie Delores Mitchell Alyson E Ochi Hiroto Shiba Moto Takayuki

Author Affiliation:Department of Environmental Toxicology, University of California, Davis, CA, 95616: tshibamoto@ucdavis.edu

Language:English

Language of Summary:English (EN)

Abstract:Typical volatile heterocyclic compounds found in brewed coffee extracts-pyrroles, furans, thiophenes, and thiazoles-were examined for antioxidative activity, which was determined by measuring the oxidative conversion of hexanal to hexanoic acid using gas chromatography. 2-Acetylpyrrole, 1-methylpyrrole, and pyrrole inhibited hexanal oxidation by 98, 87, and 78%, respectively, at a concentration of 500 mug/mL over a period of 30 days. 2-Methylfuran, which inhibited hexanal oxidation by 90% at all concentrations tested (500, 200, and 100 mug/mL) for a 30-day period, exhibited the greatest activity among furans tested. Similarly, 2-methylthiophene, which inhibited hexanal oxidation by almost 100% at a concentration of 500 mug/mL over 30 days, exhibited the greatest activity among the thiophenes tested. In general, thiazoles were ineffective antioxidants at all concentrations tested. However, 4,5-dimethylthiazole was able to inhibit hexanal oxidation by 50% at the highest level tested (500 mug/mL). 2-Acetylpyrrole, 2-methylfuran, and 2-methylthiophene at concentrations of 500, 200, and 100 mug/mL and furan at a concentration of 500 mug/mL exhibited antioxidative activities comparable to that of the synthetic antioxidant butylated hydroxytoluene at a concentration of 50 mug/mL

Descriptors:brewed coffee: beverage; coffee aroma. Biochemistry and Molecular Biophysics; Foods. furans; heterocyclic compounds: antioxidative activity; pyrroles; thiazoles; thiophenes

Subject Codes:Biochemistry and Molecular Biophysics; Foods

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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21. Title:Coffee, Economic Fluctuations and Stabilisation: An Intertemporal Disequilibrium Model with Capital Market Imperfections

View Article: Journal of Development Economics. 62 (1) 2000. 105-29

CD Volume:335

Print Article: Pages: 105-129

Author(s):Otero J G

Author Affiliation:U Rosario

Language:English

Abstract:This paper develops a two-period disequilibrium model of a small open economy under Keynesian unemployment to analyse the effects of temporary, anticipated, and permanent coffee price shocks. The model includes a government sector that administers a commodity price stabilisation fund, and allows for capital market imperfections. The type of capital market imperfection makes an important difference to the results of the model. In particular, when the government borrows on more favourable terms than individuals, the coffee price stabilisation fund reduces the multiplier effects of temporary and permanent shocks not only in the first, but also in the second period. By contrast, when individuals face an upward-sloping supply of capital curve, the stabilisation fund shifts some of these effects from the first to the second period

Descriptors:Economic Development: Agriculture; Natural Resources; Environment; Other Primary Products. International Linkages to Development; Role of International Organizations. Macroeconomics: Employment; Unemployment; Wages; wage indexation. Open Economy Macroeconomics

Subject Codes:EE450. EE900. EE600

ISSN:0304-3878

Year:2000

Journal Title:Journal of Development Economics

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22. Title:T-Coffee: A novel method for fast and accurate multiple sequence alignment

View Article: J Mol Biol 2000 Sep 8;302(1):205-17

CD Volume:305

Print Article: Pages: 205-217

Author(s):Notredame C Higgins DG Heringa J

Author Affiliation:National Institute for Medical Research, The Ridgeway, London, NW7 1AA, UK. cedric.notredame@europa.com

Abstract:We describe a new method (T-Coffee) for multiple sequence alignment that provides a dramatic improvement in accuracy with a modest sacrifice in speed as compared to the most commonly used alternatives. The method is broadly based on the popular progressive approach to multiple alignment but avoids the most serious pitfalls caused by the greedy nature of this algorithm. With T-Coffee we pre-process a data set of all pair-wise alignments between the sequences. This provides us with a library of alignment information that can be used to guide the progressive alignment. Intermediate alignments are then based not only on the sequences to be aligned next but also on how all of the sequences align with each other. This alignment information can be derived from heterogeneous sources such as a mixture of alignment programs and/or structure superposition. Here, we illustrate the power of the approach by using a combination of local and global pair-wise alignments to generate the library. The resulting alignments are significantly more reliable, as determined by comparison with a set of 141 test cases, than any of the popular alternatives that we tried. The improvement, especially clear with the more difficult test

cases, is always visible, regardless of the phylogenetic spread of the sequences in the tests

Descriptors:\*Algorithms. Amino Acid Motifs. Amino Acid Sequence. Animal. Computational Biology. Databases. Human. Molecular Sequence Data. Protein-Serine-Threonine Kinases. Reproducibility of Results. Sensitivity and Specificity. Sequence Alignment. Sequence Homology, Amino Acid. Software. Support, Non-U.S. Gov't

Geographic Locator:ENGLAND

ISSN:0022-2836

Year:2000

Journal Title:Journal of Molecular Biology

23. Title:Uptake of radiolabelled ochratoxin A from soil by coffee plants

View Article: Phytochemistry (Oxford). 53 (3). Feb., 2000. 377-378

CD Volume:330

Print Article: Pages: 377-378

Author(s):Mantle Peter G

Author Affiliation:Biochemistry Department, Imperial College of Science, Technology and Medicine, London, SW7 2AY

Language:English

Language of Summary:English (EN)

Abstract:(3H, 14C) Ochratoxin A, prepared biosynthetically, was applied in dilute NaHCO<sub>3</sub> solution to the soil in which coffee plants had grown to four pairs of leaves. Three weeks later the compound, isolated from dilute NaHCO<sub>3</sub> extract of leaves by immunoaffinity chromatography, was detected by scintillation counting as a 1-2 ppm component of leaf dry weight, greatly exceeding the trace (ppb) occurrence of ochratoxin A in some green coffees, which therefore might arise in the field directly from fungal activity in soil rather than from fungal infection of cherries or processed green coffee

Descriptors:phytochemistry; soil chemistry. Biochemistry and Molecular Biophysics. carbon-14: radiolabel; hydrogen-3: radiolabel; radiolabeled ochratoxin A: uptake

Organism Descriptors:Coffea arabica [coffee] (Rubiaceae)

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Biochemistry and Molecular Biophysics

ISSN:0031-9422

Year:2000

Journal Title:Phytochemistry

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24. Title:Characterization of polyphenol oxidase in coffee

View Article: Phytochemistry (Oxford). 55 (4). October, 2000. 285-296

CD Volume:330

Print Article: Pages: 285-296

Author(s):Mazzafera Paulo Robinson Simon P

Author Affiliation:Horticulture Unit, CSIRO Plant Industry, Glen Osmond, SA, 5064: simon.robinson@pi.csiro.au

Language:English

Language of Summary:English (EN)

Abstract:Polyphenol oxidase (PPO) was characterized in partially purified extracts of leaves (PPO-L) and fruit endosperm (PPO-E) of coffee (*Coffea arabica* L.). PPO activity was higher in early developmental stages of both leaves and endosperm of fruits. Wounding or exposure of coffee leaves to methyl jasmonate increased PPO activity 1.5-4- fold. PPO was not latent and was not activated by protease treatment. PPO activity was stimulated 10-15% with sodium dodecyl sulphate (SDS) at 0.35-1.75 mM, but at higher concentrations activities were similar to the control samples, without detergent. Prolonged incubation of extracts with trypsin or proteinase K inhibited PPO activity but pepsin had no effect. Inhibition of PPO with proteinase K was increased in the presence of SDS. PPO activity from both tissues was optimal at pH 6-7 and at an assay

temperature of 30degreeC. Activity was highest with chlorogenic acid as substrate with a Km of 0.882 mM (PPO-L) and 2.27 mM (PPO- E). Hexadecyl trimethyl-ammonium bromide, polyvinylpyrrolidone 40, cinnamic acid and salicylhydroxamic acid inhibited PPO from both tissues. Both enzymes were inactivated by heat but the activity in endosperm extracts was more heat labile than that from leaves. The apparent Mr determined by gel filtration was 46 (PPO-L) and 50 kDa (PPO-E). Activity-stained SDS-polyacrylamide gel electrophoresis (PAGE) gels and western blots probed with PPO antibodies suggested the existence of a 67 kDa PPO which is susceptible to proteolytic cleavage that generates a 45 kDa active form

Descriptors:coffee: beverage, coffee; wounding. Enzymology (Biochemistry and Molecular Biophysics); Foods. catechol oxidase; polyphenol oxidase [EC 1.10.3.2]: characterization; proteinase K

Organism Descriptors:Coffea arabica [coffee] (Rubiaceae). fruit endosperm: reproductive system; leaves

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Enzymology (Biochemistry and Molecular Biophysics); Foods

ISSN:0031-9422

Year:2000

Journal Title:Phytochemistry

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25. Title:Disease complex in coffee involving *Meloidogyne arabicida* and *Fusarium oxysporum*

View Article: Plant Pathology. 2000. 49 (3). 383-388

CD Volume:331

Print Article: Pages: 383-388

Author(s):Bertrand B Nunez C Sarah J L

Author Affiliation:Centre de Cooperation Internationale en Recherches Agronomique pour le Developpement, Departement des Cultures Perennes (CIRAD CP), BP 5035, 34032, Montpellier Cedex, France

Language:English

Abstract:Coffee corky-root disease, also called corchosis, was first detected in 1974 in a small area of Costa Rica where the root-knot nematode *Meloidogyne arabicida* is the dominant species. An epidemiological study revealed a constant association between *Meloidogyne* spp. and *Fusarium* sp. in cases of corky root. No corky root appears to have been reported in association with *Meloidogyne exigua*, which is the prevalent root-knot nematode on coffee in Costa Rica. *Fusarium* spp. are often cited as components of disease complexes in association with nematodes. Combined inoculations using *M. arabicida* or *M. exigua* with *Fusarium oxysporum* under controlled conditions showed that only the combination with *M. arabicida* produced corky-root symptoms on *Coffea arabica* cultivars Caturra or Catuai. *Fusarium oxysporum* alone was nonpathogenic. *Meloidogyne exigua* or *M. arabicida* alone caused galls and reduction in shoot height, but no corky-root symptoms. When cultivars susceptible and resistant to *M. arabicida* were studied under field conditions for 5 years, all the susceptible cultivars exhibited corky-root symptoms on 40-80% of their root systems. Cultivars that were resistant to *M. arabicida* but not to *M. exigua* showed no corky root. These observations lead to the conclusion that corky-root disease has a complex aetiology, and emphasize the dominant role of *M. arabicida* as a predisposing agent to subsequent invasion by *F. oxysporum*. Consequently, genetic resistance to *M. arabicida* appears to provide an effective strategy against the disease

Descriptors:coffee. interactions. cultivars. aetiology. galls. genetic-resistance. plant-parasitic-nematodes. plant-pathogens. plant-pathogenic-fungi. plant-diseases. controlled-atmospheres. pest-resistance. disease-resistance. stimulant-plants. nematology. ecology. plant-pathology

Geographic Locator:Costa-Rica

Identifiers:*Meloidogyne arabicida*. Tylenchida

Organism Descriptors:*Coffea*. *Fusarium-oxysporum*. *Meloidogyne*. *Meloidogyne-exigua*. *Coffea-arabica*

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.  
Spermatophyta. plants. Fusarium. Deuteromycotina. Eumycota. fungi.  
Meloidogynidae. Nematoda. invertebrates. animals. Meloidogyne. Coffea.  
Central-America. America. Developing-Countries. Threshold-Countries. CACM.  
Latin-America. Heteroderidae  
Subject Codes:FF610. FF620. FF005  
Supplementary Info:19 ref  
ISSN:0032-0862  
Year:2000  
Journal Title:Plant Pathology  
Copyright:Copyright CAB International

26. Title:Molecular analysis of introgressive breeding in coffee (*Coffea arabica* L.)

View Article: Theoretical and Applied Genetics. 2000. 100 (1). 139-146

CD Volume:335

Print Article: Pages: 139-146

Author(s):Lashermes P Andrzejewski S Bertrand B Combes M C Dussert S Graziosi G  
Trousnot P Anthony F

Author Affiliation:IRD (ex ORSTOM), GeneTrop, BP 5045, F-34032 Montpellier,  
France

Language:English

Abstract:Nineteen arabica coffee introgression lines (BC1F4) and two accessions derived from a spontaneous interspecific cross (i.e. Timor Hybrid (TH)) between *Coffea arabica* ( $2n = 4x = 44$ ) and *C. canephora* ( $2n = 2x = 22$ ) were analysed for the introgression of *C. canephora* genetic material. TH-derived genotypes were evaluated by amplified fragment length polymorphism (AFLP), using 42 primer combinations, and compared to 23 accessions of *C. arabica* and 8 accessions of *C. canephora*. A total of 1062 polymorphic fragments were scored among the 52 accessions analysed. Some 178 markers consisting of 109 additional bands (i.e. introgressed markers) and 69 missing bands distinguished the group composed of the TH-derived genotypes from the accessions of *C. arabica*. AFLP therefore seemed to be an extremely efficient technique for DNA marker generation in coffee as well as for the detection of introgression in *C. arabica*. The genetic diversity observed in the TH-derived genotypes appeared to be approximately double that in *C. arabica*. Although representing only a small proportion of the genetic diversity available in *C. canephora*, TH obviously constitutes a considerable source of genetic diversity for arabica breeding. Analysis of genetic relationships among TH-derived genotypes suggested that introgression was not restricted to chromosome substitution but also involved chromosome recombinations. Furthermore, TH-derived genotypes varied considerably in the number of AFLP markers attributable to introgression. In this way, the introgressed markers identified in the analysed arabica coffee introgressed genotypes were estimated to represent from 9 to 29% of the *C. canephora* genome. Nevertheless, the amount of alien genetic material in the introgression arabica lines remains substantial and should justify the development of adapted breeding strategies

Descriptors:coffee. genetic-diversity. interspecific-hybridization.  
introgression. genetic-markers. chromosome-substitution. recombination. plant-breeding. stimulant-plants. biotechnology

Identifiers:amplified fragment length polymorphism

Organism Descriptors:Coffea-canephora. Coffea-arabica. Coffea

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms.  
Spermatophyta. plants

Subject Codes:FF003. FF020. WW000

Supplementary Info:29 ref

ISSN:0040-5752

Year:2000

Journal Title:Theoretical and Applied Genetics

Copyright:Copyright CAB International



27. Title: Interspecific genetic linkage map, segregation distortion and genetic conversion in coffee (*Coffea* sp.)  
View Article: Theoretical and Applied Genetics. 2000. 101 (4). 669-676  
CD Volume: 335  
Print Article: Pages: 669-676  
Author(s): Ky C L Barre P Lorieux M Trouslot P Akaffou S Louarn J Charrier A Hamon S Noirot M  
Author Affiliation: GeneTrop, Centre IRD de Montpellier, B.P. 5045, 34032 Montpellier Cedex 1, France  
Language: English  
Abstract: An interspecific partial genetic linkage map of *Coffea* sp. based on 62 backcross hybrids is presented. F1 hybrids were generated by a cross between the wild *C. pseudozanguebariae* and the anciently cultivated *C. liberica* var. *dewevrei* (DEW); progeny were then derived from a backcross between F1 hybrid and DEW. The map construction consisted of a two-step strategy using 5.5 and 3.1 LOD scores revealed by simulation file. The map consisted of 181 loci: 167 amplified fragment length polymorphism (AFLP) and 13 RFLP loci. The markers were assembled into 14 linkage groups, each with 4-31 markers covering 1144 cM. Segregation distortion was observed for 30% of all loci, in particular 3:1 and 1:3 ratios equally favouring each of the two parents. The existence of such ratios suggests genetic conversion events. This map also represents an initial step towards the detection of quantitative trait loci  
Descriptors: coffee. linkage. hybrids. interspecific-hybridization. restriction-fragment-length-polymorphism. inheritance  
Identifiers: amplified fragment length polymorphism. *Coffea pseudozanguebariae*  
Organism Descriptors: *Coffea*. *Coffea-liberica*  
Supplemental Descriptors: Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. *Coffea*. Gentianales  
Subject Codes: FF020. WW000. FF003  
Supplementary Info: 45 ref  
ISSN: 0040-5752  
Year: 2000  
Journal Title: Theoretical and Applied Genetics  
Copyright: Copyright CAB International

28. Title: The impact of close spacing on yield of arabica coffee under contrasting agro-ecologies of Ethiopia  
View Article: African Crop Science Journal. 2001. 9 (2). 401-409  
CD Volume: 352  
Print Article: Pages: 401-409  
Author(s): Kufa T Shimber T Yilma A Netsere A Taye E  
Author Affiliation: Ethiopian Agricultural Research Organisation, Jima National Coffee Research Centre, P.O. Box 192, Jima, Ethiopia  
Language: English  
Language of Summary: English. French  
Abstract: In an attempt to investigate the efficiency of close spacing and determine the optimum density for the approved coffee berry disease (CBD) resistant selections, field experiments were conducted at Tepi, Wenago, and Gera Research Centers for eleven consecutive years (1988/89-1998/99). A randomised complete block design was used to assign seven population densities that ranged between 4,006 and 10,000 trees ha<sup>-1</sup>. Coffee yield results of seven years revealed significant yield responses to close spacing in different crop seasons at each site, specifically when the trees bore heavy crops. Subsequently, coffee yield increased with increasing population densities, though the magnitude varied across crop years and locations. The combined analysis of variance at Wenago and Tepi showed non-significant yield difference, but differences were highly significant at Gera. The interactions of crop season and spacing were also significant at Tepi and Gera, but this was not the case at Wenago. At Tepi, yield initially increased with increasing tree populations up to the fifth crop but, thereafter, tended to decrease above the population densities of 7,062 trees ha<sup>-1</sup>, at hot and humid agroecology indicating early

mutual shading effects. In contrast, in medium (Wenago) and high altitude (Gera) areas, yield increased from 13.22 to 21.84 and 17.05 to 25.84 Q ha<sup>-1</sup>, respectively, with increasing population density from 4,006 to 9,066 trees ha<sup>-1</sup>. Such impacts of close spacing on coffee yield performances were largely associated with the prevailing climatic factors that determined the rate of vegetative growth and subsequent adverse mutual shading effects

Geographic Locator:Ethiopia

Organism Descriptors:Coffea-arabica

Supplemental Descriptors:East-Africa. Africa-South-of-Sahara. Africa. Least-Developed-Countries. Developing- Countries. ACP-Countries

ISSN:1021-9730

Year:2001

Journal Title:African Crop Science Journal

29. Title:Coffee crisis calls for diversification

View Article: African Farming and Food Processing. 2001. (November/December). 11-12

CD Volume:339

Print Article: Pages: 11-12

Author(s):Watts R

Language:English

Abstract:With world tourism and basic commodities such as coffee in the doldrums, it is crucial that African countries aim to fill some of the gaps to minimise the negative effects of recession. Ronald Watts looks at some of the possibilities for Kenya

Descriptors:economics. economic-situation

Geographic Locator:Kenya

ISSN:0266-8017

Year:2001

Journal Title:African Farming and Food Processing

30. Title:Simulation of leaf transpiration and sap flow in virtual plants: model description and application to a coffee plantation in Costa Rica

View Article: Agricultural and Forest Meteorology. 2001. 109 (2). 143-160

CD Volume:375

Print Article: Pages: 143-160

Author(s):Dauzat J Rapidel B Berger A

Author Affiliation:UMP AMAP, CIRAD/AMIS, PS II, 34398 Montpellier Cedex 5, France

Language:English

Abstract:Computer representations of plants (virtual plants) are used as the basis for a model simulating leaf transpiration and sap flow. The virtual plants provide a detailed description of plant geometry and topology and, once positioned in a scene, enable a highly realistic reconstruction of a portion of the canopy. Stomatal conductance as well as energy balance are simulated by the model at the level of individual leaves in order to calculate their transpiration. Leaf transpiration is then cumulated to get the sap flow throughout the plant. Owing to its structure, the model can take into account feedbacks such as the effect of the temperature of a leaf on its stomatal conductance, transpiration and water potential, and in return, the effect of water potential of a leaf on its stomatal conductance. The model has been validated on a coffee tree stand in Costa Rica. The geometry (i.e. 3D position, area and diameter of organs) of six adult coffee trees in a row was measured in the field in order to generate a computer scene. Stomatal conductance, sap flow, water potential and wood hydraulic conductivity were measured for model parameterization and validation. Analysis of model outputs lead to a correction of leaf boundary layer thickness. After calibration, the model exhibited correct values of transpiration and water potential in different microclimatic conditions

Descriptors:coffee. computer-simulation. hydraulic-conductivity. leaf-conductance. leaves. sap-flow. simulation-models. stomata. transpiration. water-potential

Geographic Locator:Costa-Rica

Organism Descriptors:Coffea. Coffea-arabica

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Central-America. America. Developing-Countries.

Threshold-Countries. CACM. Latin-America

Subject Codes:FF003. FF060. FF062. ZZ100

Supplementary Info:57 ref

ISSN:0168-1923

Year:2001

Journal Title:Agricultural and Forest Meteorology

Copyright:Copyright CAB International

31. Title:Shade improves coffee quality in a sub-optimal coffee-zone of Costa Rica

View Article: Agroforestry Systems. 2001. 51 (2). 131-139

CD Volume:374

Print Article: Pages: 131-139

Author(s):Muschler R G

Author Affiliation:Proyecto Agroforestal CATIE/GTZ, Apdo 126, 7170 CATIE, Turrialba, Costa Rica

Language:English

Abstract:Coffee quality of Coffea arabica vars. Caturra and Catimor 5175 under different levels of shade in a low-elevation, sub-optimal environment for coffee in Turrialba, Costa Rica was compared. Fruit weight and bean size increased significantly when shade intensity was increased from 0% to more than 80% under unpruned Erythrina poeppigiana. While large beans (diameter >6.7 mm) accounted for 49 and 43% of the coffee from unshaded Caturra and Catimor, respectively, these proportions increased to 69 and 72% under dense permanent shade. This suggested a stronger shade benefit for Catimor than for Caturra. The conversion percentages from fresh-weight coffee fruits to dry-weight green coffee for export were not affected by the treatments. A blind tasting experiment showed consistent shade-induced improvements in appearance of green and roasted coffee as well as in acidity and body of the brew for both varieties. The effect of shade on aroma of the brew was neutral for Caturra and slightly negative for Catimor. It is hypothesized that, in the sub-optimal (low-altitude) coffee-zone studied, shade promotes slower and more balanced filling and uniform ripening of berries, thus yielding a better-quality product than unshaded coffee plants

Descriptors:agroforestry-systems. aroma. coffee. coffee. crop-quality. effects. multipurpose-trees. plantations. shade. shade-trees. shading. trees. varieties

Geographic Locator:Costa-Rica

Organism Descriptors:Coffea. Coffea-arabica. Erythrina-poeppigiana

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Central-America. America. Developing-Countries.

Threshold-Countries. CACM. Latin-America. Erythrina. Papilionoideae. Fabaceae. Fabales

Subject Codes:FF003. FF030. KK600. FF150. FF100. QQ050. QQ500. PP500

Supplementary Info:28 ref

ISSN:0167-4366

Year:2001

Journal Title:Agroforestry Systems

Copyright:Copyright CAB International

32. Title:Designing pest-suppressive multistrata perennial crop systems: shade-grown coffee in Central America

View Article: Agroforestry Systems. 2001. 53 (2). 151-170

CD Volume:374

Print Article: Pages: 151-170

Author(s):Staver C Guharay F Monterroso D Muschler R G

Author Affiliation:Department of Ecological Agriculture, 7170 CATIE, Turrialba, Costa Rica  
Document Editor:Muschler-R-Beer-J  
Conference Title:Multistrata agroforestry systems with perennial crops. Selected papers from an international symposium held at CATIE, Turrialba, Costa Rica, 22-27 February 1999  
Language:English  
Abstract:During most of its cultivation in Central America, coffee (*Coffea arabica*) suffered few serious pest problems. However, over the past three decades, three factors contributed to significantly increase pest levels and losses: the recent introduction of new pests; more favourable conditions for existing pests, diseases, and weeds due to lower shade levels; and secondary pest problems caused by pesticide use. The strategy of maximizing coffee production with pest control dominated by synthetic pesticides has not only increased yields substantially, but also production costs, pesticide resistance, and both human health and environmental risks. An analysis of the response of the food web in coffee plantations to varying levels of light and humidity associated with different shade levels provides the basis for identifying the optimum shade conditions which minimize the entire pest complex and maximize the effects of beneficial microflora and fauna acting against it. These optimum shade conditions for pest suppression differ with climate, altitude and soils. The selection of tree species and associations, density and spatial arrangement, as well as shade management regimes are critical decisions for shade strata design. Site-specific knowledge of the seasonal food web dynamics permits growers to determine the appropriate seasonal shade management in order to further suppress pest levels. For example in a low-elevation dry coffee zone, 35 to 65% shade promotes leaf retention in the dry season and reduces *Cercospora coffeicola*, weeds, and *Planococcus citri*; at the same time, it increases the effectiveness of microbial and parasitic organisms without contributing to increased *Hemileia vastatrix* levels or reducing yields. In these conditions, shade should be at a maximum early in the dry season and at a minimum by the middle of the rainy season  
Descriptors:agroforestry. agroforestry-systems. climate. coffee. crop-production. cropping-systems. cultural-control. food-webs. fungal-diseases. insect-pests. integrated-control. integrated-pest-management. multistorey-cropping. perennial-cropping. plant-diseases. plant-pathogenic-fungi. plant-pathogens. plant-pests. shade. shading. weed-control  
Geographic Locator:Central-America  
Organism Descriptors:*Cercospora-coffeicola*. *Coffea-arabica*. *Hemileia-vastatrix*. insects. *Planococcus-citri*  
Supplemental Descriptors:America. *Cercospora*. Deuteromycotina. Eumycota. fungi. *Coffea*. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. *Hemileia*. Uredinales. Basidiomycotina. *Planococcus*. Pseudococcidae. Coccoidea. Sternorrhyncha. Homoptera. Hemiptera. insects. arthropods. invertebrates. animals  
Subject Codes:FF003. FF150. FF610. FF620. HH200. HH300. KK600. FF500  
Supplementary Info:many ref  
ISSN:0167-4366  
Year:2001  
Journal Title:Agroforestry Systems  
Copyright:Copyright CAB International

33. Title:Hopper (Homoptera: Auchenorrhyncha) diversity in shaded coffee systems of Turrialba, Costa Rica  
View Article: Agroforestry Systems. 2001. 53 (2). 171-177  
CD Volume:374  
Print Article: Pages: 171-177  
Author(s):Rojas L Godoy C Hanson P Kleinn C Hilje L  
Author Affiliation:Red Ecorregional de America Latina Tropical, Centro Internacional de Agricultura Tropical (CIAT), P.O. Box 6713, Cali, Colombia  
Document Editor:Muschler-R-Beer-J

Conference Title:Multistrata agroforestry systems with perennial crops. Selected papers from an international symposium held at CATIE, Turrialba, Costa Rica, 22-27 February 1999

Language:English

Abstract:Diversity of hopper species (suborder Auchenorrhyncha) in coffee (*Coffea arabica*) plantations with no shade (C) was compared with the diversity in plantations with shade of either poro (*Erythrina poeppigiana*) (CP) or poro plus laurel (*Cordia alliodora*) (CPL) in Turrialba, Costa Rica. Species-abundance and rarefaction curves were plotted for each system, and indices of diversity (Shannon-Wiener), dominance (Simpson), species evenness, and similarity (Jaccard) were calculated. The majority of hopper species and individuals belonged to the Cicadellidae family. A particular species dominated in each system: *Graphocephala* sp. (C), *Fusigonalia lativittata* (CP) and *Hebralebra nicaraguensis* (CPL). The richness and diversity of hopper species were highest in the CP system, followed by the CPL and C systems. Species similarity was closest between the CP and CPL systems, but varied considerably according to plant component and geographic location of each plot. Even though hoppers have not been reported as coffee pests in Mesoamerica, some of them cause serious problems elsewhere

Descriptors:agroforestry. agroforestry-systems. animal-ecology. coffee. plantations. shade. shade-trees. shading. species-diversity. species-richness

Geographic Locator:Costa-Rica

Identifiers:*Fusigonalia lativittata*. *Hebralebra nicaraguensis*

Organism Descriptors:*Auchenorrhyncha*. *Coffea-arabica*. *Cordia-alliodora*.

*Erythrina-poeppigiana*. *Graphocephala*

Supplemental Descriptors:Homoptera. Hemiptera. insects. arthropods.

invertebrates. animals. *Coffea*. Rubiaceae. Rubiales. dicotyledons.

angiosperms. Spermatophyta. plants. *Cordia*. Boraginaceae. Lamiales. Central-

America. America. Developing-Countries. Threshold-Countries. CACM. Latin-

America. *Erythrina*. Papilionoideae. Fabaceae. Fabales. Cicadellidae.

Cicadelloidea. Auchenorrhyncha

Subject Codes:FF003. FF150. FF620. KK600. ZZ332. PP710

Supplementary Info:21 ref

ISSN:0167-4366

Year:2001

Journal Title:Agroforestry Systems

Copyright:Copyright CAB International

34. Title:Research methods for multistrata agroforestry systems with coffee and cacao: recommendations from two decades of research at CATIE

View Article: Agroforestry Systems. 2001. 53 (2). 195-203

CD Volume:374

Print Article: Pages: 195-203

Author(s):Somarriba E Beer J Muschler R G

Author Affiliation:Department of Agroforestry and Watershed Management, Apdo 44, 7170 CATIE, Turrialba, Costa Rica

Document Editor:Muschler-R-Beer-J

Conference Title:Multistrata agroforestry systems with perennial crops. Selected papers from an international symposium held at CATIE, Turrialba, Costa Rica, 22-27 February 1999

Language:English

Abstract:This paper reviews the research themes and methodologies used by CATIE in agroforestry research with shade trees over coffee (*Coffea arabica*) and cacao (*Theobroma cacao*) during the past 20 years. Initially research focused on characterization and production studies (of crop and timber including border areas) of traditional systems using temporary and permanent sample plots on private farms. The assessment area of traditional shade-coffee (or cacao) systems should be the whole plot, including the border areas, and not some subjectively selected central area which supposedly represents unit area productivity. Uncontrolled crop, tree, and management heterogeneity limited extrapolation of early on-farm research results to other farmers' fields.

Replicated case studies of best bet technologies (traditional or experimental) on different farms are often preferable to the use of formal experimental designs. On-station research included the use of systematic spacing designs to test extreme shade tree density treatments of coffee. Most nutrient cycling studies were also carried out on-station, using service and timber shade species over coffee and cacao to evaluate the ability of these agroforestry systems to maintain nutrient reserves and diversify production. Plot size (even 36x36 m) was limiting for long term research because of inter-plot interference, both below- and above ground, when using fast growing, tall timber trees as shade. These experiences suggest a minimum plot size of 2500 m<sup>2</sup>. Individual tree designs and tree-crop interface studies (e.g. regression analysis of data taken along transects) are promising experimental/sampling approaches that need further development. The principal research thrusts proposed for the next five years are biophysical process research on coffee responses to shade and competition with trees (growth, carbon allocation, phenology, disease-pest tolerance, yields and coffee quality effects) and socio-economic analyses of both traditional and new or improved shade-coffee combinations vs. monocultures

Descriptors:agricultural-research. agroforestry. agroforestry-systems. cocoa. coffee. cycling. multistorey-cropping. regression-analysis. sampling. shade-trees. shading. socioeconomics. spatial-variation

Organism Descriptors:Coffea-arabica. Theobroma-cacao

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Theobroma. Sterculiaceae. Malvales

Subject Codes:AA500. KK600. FF150. ZZ100

Supplementary Info:34 ref

ISSN:0167-4366

Year:2001

Journal Title:Agroforestry Systems

Copyright:Copyright CAB International

35. Title:Productivity and profitability of multistrata organic versus conventional coffee farms in Costa Rica

View Article: Agroforestry Systems. 2001. 53 (2). 205-213

CD Volume:374

Print Article: Pages: 205-213

Author(s):Lyngbaek A E Muschler R G Sinclair F L

Author Affiliation:School of Agricultural and Forest Sciences, University of Wales, Bangor, Gwynedd LL57 2UW, UK

Document Editor:Muschler-R-Beer-J

Conference Title:Multistrata agroforestry systems with perennial crops. Selected papers from an international symposium held at CATIE, Turrialba, Costa Rica, 22-27 February 1999

Language:English

Abstract:In areas where traditional multistrata coffee systems have been transformed to systems with patchy or no shade at all, often dependent on high chemical inputs, ecological and socioeconomic degradation has become an increasing issue. During the 1990s, rising environmental and health concerns have promoted the interest in organic production systems and their environmental services for natural resource conservation. This study compared productivity, profitability, producer-defined constraints, and goals and research priorities between ten individually paired organic and conventional coffee farms in Costa Rica. Although five of the organic farms matched or exceeded the production of their conventional counterparts, the three-year mean yield of the organic farms as a group was 22% lower than that of the conventional farms. However, excluding organic certification costs, mean variable costs and net income (NI) were similar for both groups, mainly because organic price premiums received by the farmers compensated for lower yields. If current organic certification costs are included, the price premiums paid to organic producers would have to increase to 38% in order to equal the NI from conventional coffee. Conventional farmers identified low and unstable prices as the main constraints to sustained production and stated further intensification of production as their main goal.

In contrast, the key issues for future development of the organic group centered on farm diversification, agroecological self-sufficiency, and agronomic practices that permit organic farm management

Descriptors:agroforestry. agroforestry-systems. coffee. crop-yield. farm-income. farming-systems. multistorey-cropping. organic-farming. productivity. profitability. traditional-farming

Geographic Locator:Costa-Rica

Organism Descriptors:Coffea-arabica

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Central-America. America. Developing-Countries.

Threshold-Countries. CACM. Latin-America

Subject Codes:EE115. FF003. FF150. KK600

Supplementary Info:18 ref

ISSN:0167-4366

Year:2001

Journal Title:Agroforestry Systems

Copyright:Copyright CAB International

36. Title:A new method to assess competition in coffee clonal trials with single-tree plots in Cote d'Ivoire

View Article: Agronomy Journal. 2001. 93 (1). 227-231

CD Volume:338

Print Article: Pages: 227-231

Author(s):Montagnon C Flori A Cilas C

Author Affiliation:CIRAD-CP 01 BP 6483 Abidjan 01, Cote d'Ivoire

Language:English

Abstract:A new method is proposed for the assessment of competition in clonal trials with completely randomized single-tree plots, without needing to choose a covariable a priori linked to competition. This method was applied to a robusta coffee (*Coffea canephora*) clonal trial planted in a completely randomized single-tree plot design located in Cote d'Ivoire. Microenvironmental effects were first taken into account using the conventional Papadakis method. The competition effect of each clone was then estimated as the influence of its presence on the residual value, after removal of the clonal effect, of its neighbours. Residuals were thus modelled as a linear regression of the neighbouring clones' C value. Competition effects were shown this way to explain 4% of the residual yield in young trees and 10% in adult trees. Several clones had C values significantly different from 0. Some were identified as aggressive for their neighbours ( $C < 0$ ), others as stimulating (i.e., promoting yield,  $C > 0$ ). Architecture and vigour variables that were likely to be related to the C value of clones were then sought. For young trees, vigour estimated by stem diameter, was best correlated to competition effects: vigorous clones were more aggressive than others. When the trees became adult, the length of the orthotropic internodes (Lort) was the trait that most effectively explained the competition effect (42%) of clones: the shorter the internodes, the less aggressive was the clone. In the future, Lort may thus be used in a selection index to prevent from selecting aggressive coffee clones that would undergo their own aggressiveness when grown alone in plantations

Descriptors:clonal-variation. clones. coffee. competitive-ability. internodes. methodology. plant-competition. residual-effects. selection-index. stems. vigour

Organism Descriptors:Coffea. Coffea-canephora

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants

Subject Codes:FF003. FF020. ZZ900

Supplementary Info:18 ref

ISSN:0002-1962

Year:2001

Journal Title:Agronomy Journal

Copyright:Copyright CAB International

37. Title:Retention, capture and consumption of experimental prey by orb-web weaving spiders in coffee plantations of Southern Mexico

View Article: Entomologia Experimentalis et Applicata. 2001. 98 (1). 1-8

CD Volume:370

Print Article: Pages: 1-8

Author(s):Henaut Y Pablo J Ibarra Nunez G Williams T

Author Affiliation:ECOSUR, AP 36, Tapachula, Chiapas, Mexico

Language:English

Abstract:This study focuses on the predatory capacity of four sympatric species of web-building spiders (*Gasteracantha cancriformis*, *Cyclosa caroli*, *Leucauge mariana* and *L. venusta*) that inhabit coffee plantations in Southern Mexico. The retention capabilities of the webs of these species and the incidence of prey capture and consumption were measured using eight types of insect prey belonging to the orders Coleoptera (*Hypotenemus hampei*), Hymenoptera (*Solenopsis geminata*, *Cephalonomia stephanoderis* and *Crematogaster* sp.), Diptera (*Drosophila* sp. and *Anopheles albimanus*) Lepidoptera (*Sitotroga cerealella*) and Homoptera (cicadellids). The different characteristics of each prey such as body weight, size, and defensive behaviour were recorded. The incidence of prey retention, capture and consumption were highest in *G. cancriformis*. The lowest rates of retention, capture and consumption were observed in *C. caroli*, while *L. mariana* and *L. venusta* were intermediate in their predatory capabilities. Significant negative correlations between prey size and percent consumption were detected in *L. mariana* and *L. venusta* and in *G. cancriformis*; in both cases, large prey were less likely to be immediately consumed than small prey items. *G. cancriformis* possessed long legs and a carapace and appeared to have few difficulties to manipulate all types of prey. In contrast, *C. caroli* showed less abilities to manipulate and subdue aggressive prey items, perhaps due to the short leg length and unprotected body of this species. The consumption of prey items may be related to the predatory strategy of each spider. *G. cancriformis* constructs a new web every morning and prey storage was never observed. The absence of prey storage behaviour could explain why this species consumes prey soon after capture. In contrast, *C. caroli* constructs a permanent web and stores captured prey on a stabilimentum that may explain the very low incidence of immediate consumption of prey observed in this species

Descriptors:body-weight. defence-mechanisms. predator-prey-relationships. predatory-insects. prey. retention. size. webs

Geographic Locator:Mexico

Identifiers:*Cephalonomia stephanoderis*. *Cyclosa caroli*. *Gasteracantha*.

*Gasteracantha cancriformis*. *Leucauge*. *Leucauge mariana*. *Leucauge venusta*

Organism Descriptors:Araneidae. *Cephalonomia*. Coleoptera. *Crematogaster*.

Diptera. Homoptera. Hymenoptera. insects. Lepidoptera. Tetragnathidae

Supplemental Descriptors:Araneae. Arachnida. arthropods. invertebrates. animals.

Bethylidae. Hymenoptera. insects. *Cephalonomia*. Formicidae. Araneidae.

Hemiptera. Tetragnathidae. North-America. America. Developing-Countries.

Threshold-Countries. Latin-America. OECD-Countries

Subject Codes:YY500. HH100

Supplementary Info:23 ref

ISSN:0013-8703

Year:2001

Journal Title:Entomologia Experimentalis et Applicata

Copyright:Copyright CAB International

38. Title:Genetic diversity of wild coffee (*Coffea arabica* L.) using molecular markers

View Article: Euphytica. 118 (1). 2001. 53-65

CD Volume:370

Print Article: Pages: 53-65

Author(s):Anthony F Bertrand B Quiros O Wilches A Lashermes P Berthaud J Charrier A

Author Affiliation:CATIE, 7170, Turrialba

Language:English



Language of Summary:English (EN)

Abstract:Genetic diversity was studied using RAPD markers among 119 coffee (*Coffea arabica* L.) individuals representing 88 accessions derived from spontaneous and subsponaneous trees in Ethiopia, the primary centre of species diversity, six cultivars grown locally in Ethiopia, and two accessions derived from the genetic populations Typica and Bourbon, spread in the 18th century, which gave rise to the most currently grown cultivars. Twenty-nine polymorphic fragments were used to calculate a similarity index and construct dendrograms. The Ethiopian material was separated from the Typica- and Bourbon-derived accessions and classified in four groups: one with most of the collected material from southwestern Ethiopia and three from southern and southeastern Ethiopia. Almost all detected diversity was found in the southwestern group while the southern and southeastern groups presented only 59% of identified markers. The genetic distances were low between the southwestern group and the southern and southeastern groups, and between the southwestern group and the Typica- and Bourbon-derived accessions. The cultivated coffee derived from the genetic populations Typica and Bourbon appeared little differentiated from wild coffee growing in the southwest. The results supported the hypothesis that southwestern Ethiopian coffee trees could have been introduced recently in the south and southeast. A separate analysis of the 80 accessions classified in the southwestern group allowed identifying particular spontaneous- and subsponaneous-derived accessions and redundancies in the collected material from southwestern Ethiopia. RAPD markers did not detect any within-collection polymorphism except for two trees that were identified as off-types in the CATIE field genebank

Descriptors:plant breeding. Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

Geographic Locator:Ethiopia (Ethiopian region)

Organism Descriptors:*Coffea arabica* [arabica coffee] (Rubiaceae): genetic diversity, wild trees

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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39. Title:Resistance of *Coffea arabica* cv. Ruiru 11 tested with different isolates of *Colletotrichum kahawae*, the causal agent of coffee berry disease  
View Article: Euphytica. 121 (1). 2001. 19-24

CD Volume:370

Print Article: Pages: 19-24

Author(s):Omondi C O Ayiecho P O Mwang'ombe A W Hindorf H

Author Affiliation:Coffee Research Foundation, Ruiru

Language:English

Language of Summary:English (EN)

Abstract:Seven single conidia isolates of *Colletotrichum kahawae* varying in pathogenicity were used to inoculate hybrid progenies from 66 crosses of *Coffea arabica* cv. Ruiru 11. The objective of this study was to investigate the effect of pathogen variation on resistance of the Ruiru 11 cultivar. The main effects of crosses and isolates were significant ( $p < 0.05$ ) while their interaction effects were non-significant. Partitioning variance components indicated that the proportion of phenotypic variance for resistance that is due to genetic effects was low. It was concluded that variation for resistance among hybrid progenies of the Ruiru 11 cultivar was probably due to differences in aggressiveness of the pathogen as reflected by the significant main effects of crosses and isolates in combination with other environmental factors which influence disease epidemics. The coffee berry disease pathogen is unlikely to

have adapted to the cultivar because of the non-significant crossesXisolates interaction effects  
Descriptors:disease resistance; genetic effect; hybridization; pathogenicity; phenotypic variance; plant breeding; race variation. Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management. coffee berry disease: fungal disease  
Organism Descriptors:Coffea arabica [coffee] (Rubiaceae): cultivar-Ruiru 11, host, plantation crop; Colletotrichum kahawae (Fungi Imperfecti or Deuteromycetes): phytopathogen  
Supplemental Descriptors:Fungi Imperfecti or Deuteromycetes: Fungi, Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants  
Subject Codes:Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management  
ISSN:0014-2336  
Year:2001  
Journal Title:Euphytica  
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40. Title:Characterisation of the aroma of green Mexican coffee and identification of mouldy/earthy defect  
View Article: European Food Research and Technology. 212 (6). 2001. 648-657  
CD Volume:357  
Print Article: Pages: 648-657  
Author(s):Cantergiani E Brevard H Krebs Y Feria Morales A Amado R Yeretzian C  
Author Affiliation:Nestle Research Center, Vers-chez-les-Blanc, 1000, Lausanne 26: hugues.brevard@rdls.nestle.com  
Language:English  
Language of Summary:English (EN)  
Abstract:The aromas of a reference green Mexican coffee (Arabica) and of a coffee from the same origin, but having a pronounced earthy/mouldy off-taint, were characterised. From comparison of the two aroma profiles, the compounds causing the defect were detected by gas chromatography olfactometry, isolated and concentrated by preparative bi-dimensional gas chromatography, and characterised by gas chromatography-mass spectrometry. Six compounds participated in the off-flavour. Geosmin, 2-methylisoborneol, 2,4,6-trichloroanisole were found to be the main culprits, while three methoxy pyrazines (2-methoxy-3-isopropyl/-3-sec-butyl/-3-isobutyl pyrazine) contributed to a lesser extent to the earthy/green undertone. The occurrence of the off-flavour could tentatively be linked to post-harvest drying  
Descriptors:food chemistry; food processing; food quality; food technology; green Mexican coffees: chemical analysis, coffee, moldy/earthy defect identification, off-flavors, post-harvest drying; methodology. Foods; Methods and Techniques. coffee aroma compounds: quantitative analysis  
Subject Codes:Foods; Methods and Techniques  
ISSN:1438-2377  
Year:2001  
Journal Title:European Food Research and Technology  
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41. Title:The effects of dollar/sterling exchange rate volatility on futures markets for coffee and cocoa  
View Article: European Review of Agricultural Economics. 2001. 28 (3). 307-328  
CD Volume:361  
Print Article: Pages: 307-328  
Author(s):Jumah A Kunst R M  
Author Affiliation:Institute for Advanced Studies, Austrian National Bank, Stumpergasse 56, A-1060 Vienna, Austria  
Language:English

Abstract:This paper uses multivariate autoregressive conditional heteroscedasticity models to investigate the effect of dollar or sterling exchange rate fluctuations on coffee and cocoa futures prices between the London International Financial Futures and Options Exchange and the New York Coffee, Sugar and Cocoa Exchange. The period studied is the interval between 6 March 1991 and 18 October 2000. For both commodities and in both markets, the exchange rate emerges as a main source of risk for the commodity futures price. We find that the commodities show similarities not only in their long-run features and first-order shock propagation, but also in their characteristics of volatility propagation

Descriptors:cocoa. coffee. commodities. commodity-markets. futures-trading. prices

Identifiers:exchange rates

Organism Descriptors:Coffea. Theobroma-cacao

Supplemental Descriptors:Theobroma. Sterculiaceae. Malvales. dicotyledons. angiosperms. Spermatophyta. plants. Rubiaceae. Rubiales

Subject Codes:EE110. EE111. EE130. EE700. QQ050

Supplementary Info:32 ref

ISSN:0165-1587

Year:2001

Journal Title:European Review of Agricultural Economics

Copyright:Copyright CAB International

42. Title:HPLC analysis of tocopherols and triglycerides in coffee and their use as authentication parameters

View Article: Food Chemistry. 73 (1). April, 2001. 93-101

CD Volume:377

Print Article: Pages: 93-101

Author(s):Gonzalez A G Pablos F Martin M J Leon Camacho M Valdenebro M S

Author Affiliation:Department of Analytical Chemistry, University of Seville, E-41012, Seville: m.martin@cica.es

Language:English

Language of Summary:English (EN)

Abstract:The triglyceride and tocopherol contents of green and roasted coffee beans belonging to the arabica and robusta varieties were determined by reversed phase and normal phase high resolution liquid chromatography, respectively.

Refractive index detector was used in the case of the triglycerides and fluorescence for tocopherols. Coffee oil was Soxhlet extracted with hexane. By considering the triglyceride and tocopherol profiles as chemical descriptors, a chemometric study with authentication purposes was performed to differentiate coffee varieties. Pattern recognition techniques like principal component analysis and linear discriminant analysis were carried out. Discrimination between arabica and robusta coffees was achieved with both profiles, but only tocopherols also allow the differentiation between green and roasted coffees

Descriptors:green coffee: authentication, beverage; roasted coffee: authentication, beverage. Foods; Methods and Techniques. tocopherols; triglycerides

Subject Codes:Foods; Methods and Techniques

ISSN:0308-8146

Year:2001

Journal Title:Food Chemistry

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43. Title:Who gains from product rents as the coffee market becomes more differentiated? A value-chain analysis

View Article: IDS Bulletin. 2001. 32 (3). 69-82

CD Volume:357

Print Article: Pages: 69-82

Author(s):Fitter R Kaplinksy R

Language:English

Abstract:This article applies value-chain analysis to an agricultural 'commodity', which is in the process of significant change in final product markets (coffee). By focusing on the capacity of value-chain analysis to map input-output relations, and by identifying power asymmetries along the chain, it is possible to analyse the factors explaining inter-country distributional outcomes in this sector. It is concluded that there is a simultaneous process of power concentration in importing countries and power deconcentration in producing countries. It is hypothesized that similar trends can be observed in other agricultural-based value chains

Descriptors:agricultural-products. agricultural-trade. coffee. commodities. globalization. international-trade. marketing-channels. markets. rent. trends  
Organism Descriptors:Coffea

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants

Subject Codes:EE110. EE116. EE600. EE700. QQ050

Supplementary Info:14 ref

ISSN:0265-5012

Year:2001

Journal Title:IDS Bulletin

Copyright:Copyright CAB International

44. Title:Optimizing headspace temperature and time sampling for identification of volatile compounds in ground roasted Arabica coffee

View Article: Journal of Agricultural and Food Chemistry. 49 (3). March, 2001. 1364-1369

CD Volume:367

Print Article: Pages: 1364-1369

Author(s):Sanz Cristina Ansorena Diana Bello Jose Cid Concepcion

Author Affiliation:Departamento de Bromatologia, Tecnologia de Alimentos y Toxicologia, Facultad de Farmacia, Universidad de Navarra, 31080, Pamplona: ccid@unav.es

Language:English

Language of Summary:English (EN)

Abstract:Equilibration time and temperature were the factors studied to choose the best conditions for analyzing volatiles in roasted ground Arabica coffee by a static headspace sampling extraction method. Three temperatures of equilibration were studied: 60, 80, and 90 degreeC. A larger quantity of volatile compounds was extracted at 90 degreeC than at 80 or 60 degreeC, although the same qualitative profile was found for each. The extraction of the volatile compounds was studied at seven different equilibration times: 30, 45, 60, 80, 100, 120, and 150 min. The best time of equilibration for headspace analysis of roasted ground Arabica coffee should be selected depending on the chemical class or compound studied. One hundred and twenty-two volatile compounds were identified, including 26 furans, 20 ketones, 20 pyrazines, 9 alcohols, 9 aldehydes, 8 esters, 6 pyrroles, 6 thiophenes, 4 sulfur compounds, 3 benzenic compounds, 2 phenolic compounds, 2 pyridines, 2 thiazoles, 1 oxazole, 1 lactone, 1 alkane, 1 alkene, and 1 acid

Descriptors:ground roasted Arabica coffee: beverage; headspace temperature.

Foods; Methods and Techniques. volatile compounds: identification

Subject Codes:Foods; Methods and Techniques

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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45.Title:Chemical characterization of the high molecular weight material extracted with hot water from green and roasted arabica coffee

View Article: Journal of Agricultural and Food Chemistry. 49 (4). April, 2001. 1773-1782

CD Volume:367

Print Article: Pages: 1773-1782

Author(s):Nunes Fernando M Coimbra Manuel A

Author Affiliation:Departamento de Quimica, Universidade de Aveiro, 3810-193, Aveiro: mac@dq.ua.pt

Language:English

Language of Summary:English (EN)

Abstract:The polysaccharides present in coffee infusions are known to contribute to the organoleptic characteristics of the drink, such as the creamy sensation perceived in the mouth known as "body", the release of aroma substances, and the stability of espresso coffee foam. To increase the knowledge about the origin, composition, and structure of the polysaccharide fraction, the high molecular weight material (HMWM) was extracted with hot water from two green and roasted ground arabica coffees: Costa Rica (wet processed) and Brazil (dry processed). The polysaccharides present in the green coffees HMWM were arabinogalactans (62%), galactomannans (24%), and glucans, and those found in roasted coffees were galactomannans (69%) and arabinogalactans (28%). The polysaccharides of the HMWM of the roasted coffees were less branched than those of the green coffees. The major green coffee proteins had molecular weights of 58 and 38 kDa, and the 58 kDa protein had two subunits, of 38 and 20 kDa, possibly linked by disulfide bonds. The protein fraction obtained from roasted coffees had only, a defined band with 14 kDa and a diffuse band with >200 kDa. The majority of the galactomannans were precipitated with solutions of 50% ethanol, and the size-exclusion chromatography of the roasted fractions showed coelution of polysaccharides, proteins, phenolics, and brown compounds. The use of strong hydrogen and hydrophobic dissociation conditions allowed us to conclude that the phenolics and brown compounds were linked by covalent bonds to the polymeric material

Descriptors:green coffee: coffee; roasted arabica coffee: coffee. Biochemistry and Molecular Biophysics; Foods. arabinogalactans; brown compounds; galactomannans; glucans; high molecular weight material hot water extract: characterization; phenolics; polysaccharides; proteins

Subject Codes:Biochemistry and Molecular Biophysics; Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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46. Title:Model studies on the influence of coffee melanoidins on flavor volatiles of coffee beverages

View Article: Journal of Agricultural and Food Chemistry. 49 (5). May, 2001. 2382- 2386

CD Volume:367

Print Article: Pages: 2382-2386

Author(s):Hofmann Thomas Czerny Michael Calligaris Sonia Schieberle Peter

Author Affiliation:Deutsche Forschungsanstalt fuer Lebensmittelchemie, Lichtenbergstrasse 4, D-85748, Garching: Peter.Schieberle@Lrz.tum.de

Language:English

Language of Summary:English (EN)

Abstract:Addition of the total melanoidin fraction isolated by water extraction from medium-roasted coffee powder to a model solution containing a set of 25 aroma compounds mimicking the aroma of a coffee brew reduced, in particular, the intensity of the roasty, sulfury aroma quality. Model studies performed by static headspace analysis revealed that especially three well-known coffee odorants, that is, 2-furfurylthiol (FFT), 3-methyl-2-butene-1-thiol, and 3-mercapto-3-methylbutyl formate, were significantly reduced in the headspace above an aqueous model solution when melanoidins were added. In particular, the low molecular weight melanoidins (1500- 3000 Da) led to the most significant decrease in FFT. In contrast, for example, aldehydes remained unaffected by melanoidin addition

Descriptors:coffee: aroma, beverage; medium-roasted coffee powder: coffee.

Foods. 2-furfurylthiol: flavor compound; 3-mercapto-3-methylbutyl formate:

flavor compound; 3-methyl-2-butene-1-thiol: flavor compound; aldehydes; melanoidins

Subject Codes:Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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47. Title:Chlorogenic acids as a potential criterion in coffee genotype selections

View Article: Journal of Agricultural and Food Chemistry. 49 (5). May, 2001. 2454- 2458

CD Volume:367

Print Article: Pages: 2454-2458

Author(s):Guerrero G Suarez M Moreno G

Author Affiliation:Departamento de Quimica, Universidad Nacional de Colombia, A.A 14490, Bogota: msuarez@ciencias.ciencias.unal.edu.co

Language:English

Language of Summary:English (EN)

Abstract:A systematic study by HPLC was conducted to determine the content of chlorogenic acids in green coffee beans of the Variedad Colombia (Coffea arabica Caturra var. X Hibrido de Timor) and in other genotypes of interest of C. arabica, Coffea canephora, Hibrido de Timor, and the F1 offspring derived from the crossing Caturra X Hibrido de Timor. Comparisons were made of the total content of these acids, their quantitative differences, and the presence or absence of some of them, using parametric statistical techniques and multivariate analysis. Total content differences were found between C. canephora accessions, between Tipica and Caturra varieties of C. arabica, and between Hibrido de Timor accessions. The chromatographic profile comparisons with principal component analysis separated in the first component C. canephora accessions from the rest of the genotypes, whereas the second component separated C. canephora accessions

Descriptors:genotype selections; green coffee beans: vegetable. Foods. chlorogenic acids

Organism Descriptors:Coffea arabica (Rubiaceae): genotype; Coffea canephora (Rubiaceae): genotype

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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48. Title:Comparison of the antioxidant activity of commonly consumed polyphenolic beverages (coffee, cocoa, and tea) prepared per cup serving

View Article: Journal of Agricultural and Food Chemistry. 49 (7). July, 2001. 3438-3442

CD Volume:369

Print Article: Pages: 3438-3442

Author(s):Richelle Myriam Tavazzi Isabelle Offord Elizabeth

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myriam.richelle@rdls.nestle.com

Language:English

Language of Summary:English (EN)

Abstract:In this study, the in vitro low-density lipoprotein oxidation model was used to assess the relative antioxidant activity of the polyphenolic beverages tea, coffee, and cocoa on a cup-serving basis. The beverages were prepared as 0.7-2.5% soluble coffee and 1.5-3.5% cocoa; teas (green, black, or herbal) were prepared as one tea bag infused over 5 min in 220 mL of hot water. Under these standard cup serving conditions, the antioxidant activity as determined by the

lag time was in the range of 292-948 min for coffee, 217-444 min for cocoa, 186-338 min for green tea, 67-277 min for black tea, and 6-78 min for herbal tea. Addition of milk did not alter the antioxidant activity. The influence of coffee bean source and degree of roasting was further investigated. Green coffee beans of Robusta coffee exhibited a 2-fold higher antioxidant activity than Arabica coffee, but after roasting this difference was no longer significant. In conclusion, these commonly consumed beverages have a significant antioxidant activity, the highest being soluble coffee on a cup-serving basis  
Descriptors:cocoa: beverage, biochemical analysis, preparation; coffee: beverage, biochemical analysis, preparation; tea: beverage, biochemical analysis, preparation. Biochemistry and Molecular Biophysics; Foods; Nutrition.  
plant flavonoids: biological effects; polyphenolic compounds: analysis  
Subject Codes:Biochemistry and Molecular Biophysics; Foods; Nutrition  
ISSN:0021-8561  
Year:2001

Journal Title:Journal of Agricultural and Food Chemistry  
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49. Title:Effect of roasting conditions on reduction of ochratoxin A in coffee  
View Article: Journal of Agricultural and Food Chemistry. 49 (10). October, 2001. 4713-4715

CD Volume:369

Print Article: Pages: 4713-4715

Author(s):van der Stegen Gerrit H D Essens Paulus J M van der Lijn Joost

Author Affiliation:Sara Lee Douwe Egberts, Vleutensevaart 35, NL-3532 AD, Utrecht: gvanderstegen@saralee-de.com

Language:English

Language of Summary:English (EN)

Abstract:A commercial lot of green coffee, naturally contaminated with ochratoxin A (OTA), was roasted under various conditions, and the effects on its final OTA content were determined. Precautions were taken in sampling the coffee to cope with OTA inhomogeneity. The roasting conditions were kept within the range of commercial practice. Roasting time was varied from 2.5 to 10 min, and the roast color varied from light medium to dark. The differences in OTA reduction between the different levels of roasting times and colors did not reach statistical significance. However, for all roasting conditions, the reduction was highly significant, 69% reduction over the combined results. In total, nine studies by various authors about OTA reduction during coffee roasting are now available. Seven out of these nine reported that the relevant range of OTA reductions was between 69 and 96%. Among these seven, are all four studies that reported using naturally contaminated beans, a sampling procedure adapted to mycotoxin inhomogeneity, and roasting conditions within the range of actual practice. Three different explanations are available for this reduction: physical removal of OTA with chaff, isomerization at the C-3 position into another diastereomer, and thermal degradation with possible involvement of moisture. All three explanations may play a partial role in the OTA reduction during coffee roasting

Descriptors:coffee: beverage; green coffee beans; roasted coffee beans; roasting conditions. Foods; Toxicology. ochratoxin A: natural contaminant, reduction

Subject Codes:Foods; Toxicology

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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50. Title:Formation of furfurylthiol exhibiting a strong coffee aroma during oak barrel fermentation from furfural released by toasted staves

View Article: Journal of Agricultural and Food Chemistry. 49 (10). October, 2001. 4833-4835

CD Volume:369

Print Article: Pages: 4833-4835

Author(s):Blanchard Louis Tominaga Takatoshi Dubourdieu Denis  
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bordeaux2.fr

Language:English

Language of Summary:English (EN)

Abstract:Furfurylthiol (FFT) is formed in white wines during alcoholic fermentation in the barrel from the furfural released by toasted staves. The quantity of furfural released into the must has a decisive effect on the quantity of FFT in the finished wine. Wines fermented in new barrels thus contain larger quantities of FFT than those fermented in used barrels. Fermentation conditions favorable to an excess production of H<sub>2</sub>S (hydrogen sulfide) by the yeast promote the formation of this volatile thiol. The presence of this volatile thiol in white wines is, therefore, closely related to the yeast's sulfur metabolism

Descriptors:white wine: wine. Foods. furfural: release; furfurylthiol: formation; hydrogen sulfide: production

Organism Descriptors:yeast (Fungi). toasted staves: equipment

Supplemental Descriptors:Fungi: Plantae. Fungi; Microorganisms; Nonvascular Plants; Plants

Subject Codes:Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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51. Title:Characterization of espresso coffee aroma by static headspace GC-MS and sensory flavor profile

View Article: Journal of Agricultural and Food Chemistry. 49 (11). November, 2001. 5437-5444

CD Volume:369

Print Article: Pages: 5437-5444

Author(s):Maeztu Laura Sanz Cristina Andueza Susana Paz De Pena M Bello Jose Cid Concepcion

Author Affiliation:Departamento de Bromatologia, Tecnologia de Alimentos y Toxicologia, Facultad de Farmacia, Universidad de Navarra, E 31080, Pamplona; E-Mail: ccid@unav.es

Language:English

Abstract:The aromas of three espresso coffee (EC) samples from different botanical varieties and types of roast (Arabica coffee, Robusta natural blend, and Robusta Torrefacto blend (special roast by adding sugar)) were studied by static headspace GC-MS and sensory flavor profile analysis. Seventy-seven compounds were identified in all of the EC samples. Among them, 13 key odorants have been quantified and correlated with their flavor notes by applying multivariate statistical methods. Some correlations have been found in the EC samples: some aldehydes with fruity flavors, diones with buttery flavors, and pyrazines with earthy/musty, roasty/burnt, and woody/papery flavors. By applying principal component analysis (PCA), Arabica and Robusta samples were separated successfully by principal component 1 (60.7% of variance), and Torrefacto and Natural Robusta EC samples were separated by principal component 2 (28.1% of total variance). With PCA, the aroma characterization of each EC sample could be observed. A very simple discriminant function using some key odorants was obtained by discriminant analysis, allowing the classification of each EC sample into its respective group with a success rate of 100%

Descriptors:espresso coffee: aroma characterization, coffee. Biochemistry and Molecular Biophysics; Foods; Methods and Techniques

Subject Codes:Biochemistry and Molecular Biophysics; Foods; Methods and Techniques

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry



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52. Title:Fate of mucilage cell wall polysaccharides during coffee fermentation  
View Article: Journal of Agricultural and Food Chemistry. 49 (11). November,  
2001. 5556-5559

CD Volume:369

Print Article: Pages: 5556-5559

Author(s):Avallone S Guiraud J P Guyot B Olguin E Brillouet J M

Author Affiliation:CIRAD-FLHOR, Montpellier Cedex 5; E-Mail: brillouet@cirad.fr

Language:English

Abstract:Effects of a 20-h fermentation on cell wall polysaccharides from the mucilage of pulped coffee beans were examined and compared to those of unfermented beans, on alcohol insoluble residues (AIRs), their hot-water-soluble crude pectic substances (PECTs), and their hot-water-insoluble residues (RESs). Yields and compositions were very similar: AIRs, which consisted of apprx30% highly methylated pectic substances, apprx9% cellulose, and apprx15% neutral noncellulosic polysaccharides, exhibited no apparent degradation. However, PECTs from fermented beans were shown to have undergone a slight reduction of their intrinsic viscosity and weight-average molecular weight by capillary viscosimetry and high-performance size-exclusion chromatography. After fermentation, hot-water- insoluble pectic substances of RES exhibited partial de- esterification. Removal of coffee bean mucilage by natural fermentation seems to result from a restricted pectolysis, the mechanism of which remains to be elucidated

Descriptors:coffee: beverage. Biochemistry and Molecular Biophysics; Foods.

polysaccharides: cell wall mucilage chemistry

Organism Descriptors:Coffea arabica var. typica [coffee] (Rubiaceae)

Supplemental Descriptors:Rubiaceae; Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Biochemistry and Molecular Biophysics; Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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53. Title:A note on the influence of gender relations on the technical efficiency of smallholder coffee production in Papua New Guinea

View Article: Journal of Agricultural Economics. 2001. 52 (1). 153-156

CD Volume:356

Print Article: Pages: 153-156

Author(s):Overfield D Fleming E

Language:English

Abstract:This paper reports an analysis of the impact of gender relations on the technical efficiency of coffee smallholders in Papua New Guinea. The analysis entailed the detailed monitoring of 18 households in 6 villages in Benabena District, Eastern Highlands Province, over a 2-year period (1992 and 1993). Likelihood ratio tests revealed significant technical inefficiencies in coffee production. The mean technical efficiency for the whole period was 0.57 (with a standard deviation of 0.30). The following gender factors significantly influenced technical efficiency: the proportion of male labour; the incentive effect on women supplying their labour in coffee production; the commitment by male and female household heads to the commercial production of coffee; and the education of the male household head. An important policy finding is the pressing need to explore the reasons for productivity discrepancies between men and women in coffee production for average and "best practice" farmers. Another potential area for policy analysis is the scope for satisfying women's needs in, and commitment to, cash cropping through extension work, in light of the finding that women's attitude to cash cropping is positively associated with technical efficiency in coffee production

Descriptors:coffee. crop-production. efficiency. female-labour. gender-relations. male-labour. productivity

Geographic Locator: Papua-New-Guinea  
Organism Descriptors: Coffea  
Supplemental Descriptors: New-Guinea. Melanesia. Australasia. Oceania. Pacific-Islands. Developing-Countries. ACP-Countries. Commonwealth-of-Nations. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes: EE110. EE111. EE900. FF003. FF100. UU500  
Supplementary Info: 4 ref  
ISSN: 0021-857X  
Year: 2001  
Journal Title: Journal of Agricultural Economics  
Copyright: Copyright CAB International

54. Title: Occurrence of ochratoxin A-producing fungi in raw Brazilian coffee  
View Article: Journal of Food Protection. 64 (8). August, 2001. 1226-1230  
CD Volume: 362

Print Article: Pages: 1226-1230

Author(s): Urbano G R Taniwaki M H de F Leitao M F Vicentini M C

Author Affiliation: Institute of Food Technology, Campinas, SP, 13073-001:  
gross@fea.unicamp.br or mtaniwak@ital.org.br

Language: English

Language of Summary: English (EN)

Abstract: Ochratoxin A (OA)-producing fungi were identified in coffee at different stages of maturation. The toxin was quantified in coffee during terrace drying and in coffee stored in barns. By direct plating, a high level of contamination (100%) was found in the coffee beans studied, with the genus *Aspergillus* representing 33.2%, of which *Aspergillus ochraceus* and *Aspergillus niger* represented 10.3 and 22.9%, respectively, of the strains isolated from the coffee beans. The capacity to produce ochratoxin was determined in 155 strains of *A. ochraceus* and *A. niger* using both the agar plug method and extraction with chloroform, giving positive results for 88.1% of the *A. ochraceus* strains and 11.5% of the *A. niger* strains. Analysis for OA in the terrace and barn coffee samples showed that, independent of cultivar, year harvested, or production region, all except one of the samples analyzed showed mycotoxin levels below the limit suggested by the European Common Market (8 µg/kg), thus indicating that the problem is restricted and due to severe faults in harvesting and storage practices

Descriptors: raw Brazilian coffee: beverage. Foods; Toxicology. ochratoxin A: food contaminant, mycotoxin

Organism Descriptors: *Aspergillus niger* (Fungi Imperfecti or Deuteromycetes): food contaminant; *Aspergillus ochraceus* (Fungi Imperfecti or Deuteromycetes): food contaminant

Supplemental Descriptors: Fungi Imperfecti or Deuteromycetes: Fungi, Plantae. Fungi; Microorganisms; Nonvascular Plants; Plants

Subject Codes: Foods; Toxicology

ISSN: 0362-028X

Year: 2001

Journal Title: Journal of Food Protection

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55. Title: Development of a flow-through enzyme immunoassay and application in screening green coffee samples for ochratoxin A with confirmation by high-performance liquid chromatography

View Article: Journal of Food Protection. 64 (10). October, 2001. 1597-1602  
CD Volume: 362

Print Article: Pages: 1597-1602

Author(s): Sibanda L De Saeger S Bauters T G M Nelis H J Van Peteghem C

Author Affiliation: Faculty of Pharmaceutical Sciences, Laboratory of Food Analysis, Ghent University, Harelbekestraat 72, 9000, Ghent:

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Language: English

Language of Summary: English (EN)

Abstract: A flow-through enzyme immunoassay has been developed for the screening of green coffee bean samples for ochratoxin A (OA) and was later used in a survey on OA in green coffee from different countries. The test has a sensitivity of 8 ng/g, and calculated recoveries ranged from 70 to 89% and from 86 to 95% for spiked and naturally contaminated samples, respectively. There were no significant differences in within-day and between-day assay performance ( $P > 0.05$ ). Green coffee samples (15 Arabica and 7 Robusta) received from an international coffee trader were analyzed for intrinsic fungal contamination, screened for OA, and subsequently confirmed by high-performance liquid chromatography (HPLC). All 22 samples were contaminated by fungal species of the genus *Aspergillus*, while *Penicillium* species were isolated from a mere 13.6% of the total number of samples. Isolates were tested for their ability to produce OA, and only 3.9% were positive. There was no correlation between occurrence of OA-producing isolates and levels of OA in contaminated samples. Results of the screening procedure showed that 4 of the 22 samples were contaminated with 8 ng/g or higher. The HPLC method confirmed that the OA levels ranged from 27 to 168 ng/g. A fifth sample, which was shown to be negative during screening, had an OA concentration of 4 ng/g. There were no false negatives or positives recorded, and the flow-through enzyme immunoassay results correlated with those obtained by HPLC

Descriptors: food protection; food toxicology; fungal food contamination: detection, prevention; green coffee beans: chemical analysis, coffee, samples; methodology. Foods; Methods and Techniques; Toxicology. ochratoxin A: detection methods, food residue, mycotoxin

Organism Descriptors: coffee (Rubiaceae); molds (Fungi)

Supplemental Descriptors: Fungi: Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes: Foods; Methods and Techniques; Toxicology

ISSN: 0362-028X

Year: 2001

Journal Title: Journal of Food Protection

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56. Title: Growth response of coffee tree shoots and roots to subsurface liming

View Article: Plant and Soil. 2001. 234 (2). 207-214

CD Volume: 372

Print Article: Pages: 207-214

Author(s): Rodrigues L A Martinez H E P Neves J C L Novais R F Mendonca S M

Author Affiliation: Laboratorio de Solos, Univ. Estadual do Norte Fluminense, Av. Alberto Lamego, 2000, Horto, 28015-620-Campos dos Goytacazes, RJ, Brazil

Language: English

Abstract: In the greenhouse, the growth of two coffee-tree cultivars, Catuai (sensitive) and Icatu (tolerant) in response to aluminium (Al), was evaluated in surface-fertilized and limed soil following subsurface treatment with seven lime levels (0.0; 0.49; 1.7; 2.9; 4.1; 6.6 and 9.3 t/ha). Plants were grown for 6.5 months in soils in PVC columns, subdivided into two horizons. In the lower 12-34 cm depth horizon, soil Al saturation varied between 93 and 0%. For both cultivars evaluated, shoot dry weight and leaf area remained unchanged following limestone application. This fact shows that surface layer correction permitted normal shoot growth. High Al saturation resulted in decrease of root dry weight percent, root length percent and root surface percent in the 12-34 cm horizon, which were compensated by higher percentages of these properties in the upper 0-12 cm horizon. The ratio between root surface/root dry matter (in cm<sup>2</sup>/g) of Catuai, was increased by limestone application to the lower soil horizons, indicating that roots turn longer and thinner, when Al soil saturation decreased. This also shows a great sensitivity to Al of the cultivar Catuai. In contrast, in Icatu, all root characteristics remained stable at all levels of Al tested

Descriptors:aluminium. coffee. cultivars. dry-matter-accumulation. growth. leaf-area. leaves. liming. metal-tolerance. phytotoxicity. protected-cultivation. shoots. soil-depth

Organism Descriptors:Coffea

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants

Subject Codes:FF003. FF020. FF060. FF100. FF800. FF900. JJ400. JJ700

Supplementary Info:22 ref

ISSN:0032-079X

Year:2001

Journal Title:Plant and Soil

Copyright:Copyright CAB International

57. Title:Molecular and biochemical characterization of endo- beta -mannanases from germinating coffee (*Coffea arabica*) grains

View Article: Planta. 2001. 213 (2). 296-308

CD Volume:355

Print Article: Pages: 296-308

Author(s):Marraccini P Rogers W J Allard C Andre M L Caillet V Lacoste N Lausanne F Michaux S

Author Affiliation:Department of Plant Science, Nestle Research Centre, 101 Avenue Gustave-Eiffel, B.P.9716, 37097 Tours Cedex 2, France

Language:English

Abstract:The activity of endo- beta -mannanase ([1 right arrow 4]- beta -mannan endohydrolase, EC 3.2.1.78) is likely to be central to the metabolism of cell wall mannans during the germination of grains of coffee (*Coffea* spp.). In the present paper, we report the cloning and sequencing of two endo- beta -mannanase cDNAs (manA and manB) by different strategies from *Coffea arabica*. The manA cDNA was obtained by the use of oligonucleotides homologous to published sequences of other endo- beta -mannanases and manB by the use of oligonucleotides deduced from a purified enzyme from coffee. ManA and B proteins share about 56% sequence homology and include highly conserved regions found in other mannan endohydrolases. Purification of the activity by chromatography followed by separation by two-dimensional electrophoresis and amino acid sequencing demonstrated the existence of at least seven isomers of the ManB form. The existence of multiple manB genes was also indicated by Southern analysis, whereas only one or two gene copies were detected for manA. Northern hybridizations with manA- and manB-specific probes showed that mRNA transcripts for both cDNAs were present at the same periods of bean germination with transcript peaks at 20 days after imbibition of water (DAI). Transcripts were not detected during grain maturation or in the other tissues such as roots, stems, flowers and leaves. The peak endo- beta -mannanase activity occurred at approximately 28 DAI and was not detected in grains prior to imbibition. Activity and mRNA levels appeared to be tightly coordinated. Tests of substrate specificity with the purified ManB enzyme showed that activity required a minimum of five mannose units to function efficiently

Descriptors:coffee. complementary-DNA. DNA-cloning. DNA-sequencing. enzyme-activity. enzymes. genes. isomers. mannans. mannose. messenger-RNA

Identifiers:mannan endo-1,4-beta-mannosidase

Organism Descriptors:Coffea. Coffea-arabica

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants

Subject Codes:FF003. FF020. FF060. WW000

Supplementary Info:43 ref

ISSN:0032-0935

Year:2001

Journal Title:Planta

Copyright:Copyright CAB International

58. Title:Genotype-location interactions for *Coffea canephora* yield in the Ivory Coast

View Article: Agronomie. 2000. 20 (1). 101-109

CD Volume:336

Print Article: Pages: 101-109

Author(s):Montagnon C Cilas C Leroy T Yapo A Charmetant P

Author Affiliation:Centre National de Recherche Agronomique, Cote d'Ivoire

Language:English

Language of Summary:french

Abstract:A multi-site clonal trial comprising 16 *C. canephora* clones and 9 locations in the Ivory Coast was used to study genotype environment interaction for yield. Yields were analysed using a two-way analysis of variance (ANOVA), ecovalences, linear regression of clones at selected sites and the Nassar and Huhn tests. Certain interactions were detected, even though several clones proved to be stable. Multivariate analysis was used to describe interaction structuring and to group locations according to clonal response

Descriptors:clones. multivariate-analysis. genotype-environment-interaction. yields. stimulant-plants. coffee

Geographic Locator:Cote-d'Ivoire

Organism Descriptors:Coffea. Coffea-canephora

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants. Coffea. West-Africa. Africa-South-of-Sahara. Africa.

Developing-Countries. ACP-Countries. Francophone-Africa

Subject Codes:FF003. FF100. FF020

Supplementary Info:26 ref

ISSN:0249-5627

Year:2000

Journal Title:Agronomie

Copyright:Copyright CAB International

59. Title:Wood elasticity of several *Coffea canephora* Pierre clones. A new trait to be included in selection schemes

View Article: Agronomie. 2000. 20 (4). 439-444

CD Volume:336

Print Article: Pages: 439-444

Author(s):Cilas C Montagnon C Bertrand B Godin C

Author Affiliation:Centre de Cooperation International en Recherche Agronomique pour le Developpement (CIRAD), CIRAD-CP, B.P. 5035, 34032 Montpellier Cedex, France

Language:English

Language of Summary:french

Abstract:Genetic improvement of tree crops cultivated for their fruits or seeds does not usually take into account the physical properties of their wood. Yet, wood breakage in coffee trees during harvests or lodging are major defects in some cultivars. Such defects are linked to certain physical properties of the wood, such as elasticity, which is characterized by a parameter used in resistance testing of materials: the modulus of elasticity (MOE), or Young's modulus. The MOE of several coffee clones (*Coffea canephora*) was therefore evaluated in the Ivory Coast and in Togo. An estimation of broad sense heritability for the MOE gave a value of around 0.3. The species can therefore be genetically improved for this parameter. The MOE could also be used to predict certain traits of agronomical interest. Moreover, it is necessary to estimate this parameter to model coffee tree architecture, notably with a view to establishing eco-physiological models. The measuring method is to be improved, so as to obtain more accurate estimations

Descriptors:clones. elasticity. modulus-of-elasticity. breakage. coffee. cultivars. fruit-crops. heritability. lodging. physical-properties. properties. tree-breeding. plant-breeding. plantation-crops. woody-plants. wood-properties

Geographic Locator:Cote-d'Ivoire. Togo

Organism Descriptors:Coffea. Coffea-canephora

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants. Coffea. West-Africa. Africa-South-of-Sahara. Africa.

Developing-Countries. ACP-Countries. Francophone-Africa. Least-Developed-Countries

Subject Codes:FF030. FF020

Supplementary Info:19 ref

ISSN:0249-5627

Year:2000

Journal Title:Agronomie

Copyright:Copyright CAB International

60. Title:Photosynthetic acclimation to high light conditions in mature leaves of *Coffea arabica* L.: role of xanthophylls, quenching mechanisms and nitrogen nutrition

View Article: Australian Journal of Plant Physiology. 2000. 27 (1). 43-51

CD Volume:324

Print Article: Pages: 43-51

Author(s):Ramalho J C Pons T L Groeneveld H W Azinheira H G Nunes M A

Author Affiliation:Instituto de Investigacao Cientifica Tropical, CEPTA, Tapada da Ajuda, Ap. 3014, P-1301 Lisboa Codex, Portugal

Language:English

Abstract:In greenhouse and field trials in the Netherlands and Portugal, 1.5- to 2-year-old arabica coffee plants (cv. Catuai), originally from a shaded habitat, were separated in 3 groups to be grown under different levels of N

fertilization: 0.3 mmol N supplements were given to the soil every 7 days (high N treatment, 2N), every 15 days (medium N treatment, 1N) and every 45 days (low N treatment, 0N). These plants were later exposed to a high sunlight irradiance (noon PPFD up to 1500 micro mol m<sup>-2</sup> s<sup>-1</sup>) for a period of 12 or 15 days. Among others, the values of electron transport capacity, maximum carboxylation activity, photosynthetic capacity (Amax) and several fluorescence parameters (Fv/Fm, Fv'/Fm', qP, phi e) first showed a reduction (until the 4th-7th day) in all N treatments, followed by an N-dependent recovery. The 2N plants were less affected in the first few days and, at the end of the stress period, showed a better recovery for most of the studied parameters and the highest increase in the saturating PPFD for net photosynthesis and Amax. The present work shows that the ability to acclimatize displayed by the mature leaves of 2N plants was accompanied by an increase in energy dissipation mechanisms. These include an increase in the 'high energy' quenching and, mostly, the presence of higher contents of some xanthophylls (zeaxanthin and lutein) and carotenenes, which helped to decrease the energetic overcharge in the photosystems. Pigment changes in mature leaves suggest that N can promote specific mechanisms of acclimatization others than those that might be expected from a preferential partition of the element N into photosynthetic components

Descriptors:nitrogen. plant-nutrition. xanthophylls. carotenenes. coffee.

electron-transfer. fluorescence. xanthophyll. photosynthesis. solar-radiation. supplements. zeaxanthin. light-intensity. stimulant-plants

Geographic Locator:Netherlands. Portugal

Organism Descriptors:Coffea-arabica. Coffea

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Western-Europe. Europe. Developed-Countries. Benelux. European-Union-Countries. OECD-Countries. Southern-Europe. Mediterranean-Region

Subject Codes:FF003. FF061. FF900. FF060

Supplementary Info:43 ref

ISSN:0310-7841

Year:2000

Journal Title:Australian Journal of Plant Physiology

Copyright:Copyright CAB International

61. Title:Genetic study of *Coffea canephora* coffee tree resistance to *Meloidogyne incognita* nematodes in Guatemala and *Meloidogyne* sp. nematodes in El Salvador for selection of rootstock varieties in Central America

View Article: Euphytica. 113 (2). 2000. 79-86

CD Volume:310

Print Article: Pages: 79-86

Author(s):Bertrand B Pena Duran M X Anzueto F Cilas C Etienne H Anthony F Eskes A B

Author Affiliation:IICA/CIRAD, 2200, Coronado

Language:English

Language of Summary:English (EN)

Abstract:Root-knot nematodes, *Meloidogyne incognita* in Guatemala and *Meloidogyne* sp. in El Salvador frequently cause very serious damage to *Coffea arabica*.

Hypocotyledon grafting on *C. canephora* var. *Robusta* is practiced on a very wide scale to control these pests. However, rootstock seeds come from non selected trees which provide 30-40% resistance. In this article, we examine the possibility of improving resistance to *M. incognita* and *Meloidogyne* sp. Hybrids were created using two North Carolina II factorial mating designs and tested under controlled conditions for resistance to isolates of the two nematodes. In the trial with *Meloidogyne* sp. the number of nematodes per plant was counted, and in the trial with *M. incognita* a root damage index was established.

Vegetative measurements (height, weight of aerial parts and roots) were taken in both trials. The parents were classed according to their cross value and genetic variance was estimated. In the factorial trial conducted with the *Meloidogyne* sp. isolate from El Salvador, parents T3561 and T3751 transmitted high resistance levels of 56 and 54%, respectively, to their progenies, as opposed to 9% for the other parents. The cross between those two parents achieved 78% resistant plants. In the trial with the *M. incognita* isolate from Guatemala, similar results were found. The same two parents transmitted resistance to 64% of their progenies, as opposed to 36% for the other parents. Classification of the parents did not differ from one trial to the other. The existence of a complex nematode resistance locus in the *C. canephora* species seems highly likely. The results show that it is possible to select rootstock varieties that are more resistant to the main *Meloidogyne* nematodes in Guatemala and El Salvador. Given the average heritability values (0.28-0.30) and the possibility of applying strong selection intensity, the genetic progress expected in the next selection cycle should be substantial

Descriptors:pest resistance; plant breeding; rootstock selection. Horticulture (Agriculture); Infection; Pest Assessment Control and Management

Geographic Locator:Central America (Neotropical region); El Salvador (Central America, Neotropical region); Guatemala (Central America, Neotropical region)

Organism Descriptors:*Coffea canephora* [coffee tree] (Rubiaceae): host;

*Meloidogyne incognita* (Nematoda): phytoparasite; *Meloidogyne* sp. (Nematoda): phytoparasite

Supplemental Descriptors:Nematoda: Aschelminthes, Helminthes, Invertebrata, Animalia; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae.

Angiosperms; Animals; Aschelminths; Dicots; Helminths; Invertebrates; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Infection; Pest Assessment Control and Management

ISSN:0014-2336

Year:2000

Journal Title:Euphytica

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62. Title:Development of ochratoxin A during *Robusta* (*Coffea canephora*) coffee cherry drying

View Article: Journal of Agricultural and Food Chemistry. 48 (4). April, 2000. 1358-1362

CD Volume:301

Print Article: Pages: 1358-1362

Author(s):Bucheli Peter Kanchanomai Chaorai Meyer Inge Pittet Alain

Author Affiliation:Nestle Research Center, 101 Av. Gustave Eiffel, F-37390, Notre Dame d'Oe

Language:English

Language of Summary:English (EN)

Abstract:The occurrence and formation of ochratoxin A (OTA) in Robusta coffee was studied for three consecutive seasons under tropical conditions in Thailand. Sun drying of coffee cherries consistently led to OTA formation in the pulp and parchment (husks) of the cherries. In replicated trials, dried coffee beans (green coffee) were shown to contain on average OTA concentrations that were approx 1% of those found in husks. OTA contamination of green coffee depended on cherry maturity, with green cherries being the least, and overripe cherries the most susceptible. Defects, and in particular the inclusion of husks, are the most important source of OTA contamination. OTA contamination occurred independently of whether cherries were placed on concrete, on bamboo tables, or on the ground. The study suggests that better raw material quality, an appropriate drying and dehulling procedure combined with a reduction of green coffee defects can effectively contribute to the reduction of OTA in green coffee

Descriptors:Foods; Toxicology. ochratoxin A: toxin

Organism Descriptors:Coffea canephora [robusta coffee] (Rubiaceae); mold (Fungi): contaminant

Supplemental Descriptors:Fungi: Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods; Toxicology

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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63. Title:Molecular analysis of introgressive breeding in coffee (*Coffea arabica* L.)

View Article: Theoretical and Applied Genetics. 2000. 100 (1). 139-146

CD Volume:335

Print Article: Pages: 139-146

Author(s):Lashermes P Andrzejewski S Bertrand B Combes M C Dussert S Graziosi G Trouslot P Anthony F

Author Affiliation:IRD (ex ORSTOM), GeneTrop, BP 5045, F-34032 Montpellier, France

Language:English

Abstract:Nineteen arabica coffee introgression lines (BC1F4) and two accessions derived from a spontaneous interspecific cross (i.e. Timor Hybrid (TH)) between *Coffea arabica* ( $2n = 4x = 44$ ) and *C. canephora* ( $2n = 2x = 22$ ) were analysed for the introgression of *C. canephora* genetic material. TH-derived genotypes were evaluated by amplified fragment length polymorphism (AFLP), using 42 primer combinations, and compared to 23 accessions of *C. arabica* and 8 accessions of *C. canephora*. A total of 1062 polymorphic fragments were scored among the 52 accessions analysed. Some 178 markers consisting of 109 additional bands (i.e. introgressed markers) and 69 missing bands distinguished the group composed of the TH-derived genotypes from the accessions of *C. arabica*. AFLP therefore seemed to be an extremely efficient technique for DNA marker generation in coffee as well as for the detection of introgression in *C. arabica*. The genetic diversity observed in the TH-derived genotypes appeared to be approximately double that in *C. arabica*. Although representing only a small proportion of the genetic diversity available in *C. canephora*, TH obviously constitutes a considerable source of genetic diversity for arabica breeding. Analysis of genetic relationships among TH-derived genotypes suggested that introgression was not restricted to chromosome substitution but also involved chromosome recombinations. Furthermore, TH-derived genotypes varied considerably in the number of AFLP markers attributable to introgression. In this way, the introgressed markers identified in the analysed arabica coffee introgressed genotypes were estimated to represent from 9 to 29% of the *C. canephora* genome. Nevertheless, the amount of alien genetic material in the introgression arabica



lines remains substantial and should justify the development of adapted breeding strategies

Descriptors:coffee. genetic-diversity. interspecific-hybridization. introgression. genetic-markers. chromosome-substitution. recombination. plant-breeding. stimulant-plants. biotechnology  
Identifiers:amplified fragment length polymorphism  
Organism Descriptors:Coffea-canephora. Coffea-arabica. Coffea  
Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes:FF003. FF020. WW000  
Supplementary Info:29 ref  
ISSN:0040-5752  
Year:2000  
Journal Title:Theoretical and Applied Genetics  
Copyright:Copyright CAB International

64. Title:Interspecific genetic linkage map, segregation distortion and genetic conversion in coffee (*Coffea* sp.)

View Article: Theoretical and Applied Genetics. 2000. 101 (4). 669-676  
CD Volume:335

Print Article: Pages: 669-676

Author(s):Ky C L Barre P Lorieux M Trouslot P Akaffou S Louarn J Charrier A Hamon S Noirot M

Author Affiliation:GeneTrop, Centre IRD de Montpellier, B.P. 5045, 34032 Montpellier Cedex 1, France

Language:English

Abstract:An interspecific partial genetic linkage map of *Coffea* sp. based on 62 backcross hybrids is presented. F1 hybrids were generated by a cross between the wild *C. pseudozanguebariae* and the anciently cultivated *C. liberica* var.

*dewevrei* (DEW); progeny were then derived from a backcross between F1 hybrid and DEW. The map construction consisted of a two-step strategy using 5.5 and 3.1 LOD scores revealed by simulation file. The map consisted of 181 loci: 167 amplified fragment length polymorphism (AFLP) and 13 RFLP loci. The markers were assembled into 14 linkage groups, each with 4-31 markers covering 1144 cM. Segregation distortion was observed for 30% of all loci, in particular 3:1 and 1:3 ratios equally favouring each of the two parents. The existence of such ratios suggests genetic conversion events. This map also represents an initial step towards the detection of quantitative trait loci

Descriptors:coffee. linkage. hybrids. interspecific-hybridization. restriction-fragment-length-polymorphism. inheritance

Identifiers:amplified fragment length polymorphism. *Coffea pseudozanguebariae*

Organism Descriptors:Coffea. Coffea-liberica

Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms.

Spermatophyta. plants. Coffea. Gentianales

Subject Codes:FF020. WW000. FF003

Supplementary Info:45 ref

ISSN:0040-5752

Year:2000

Journal Title:Theoretical and Applied Genetics

Copyright:Copyright CAB International

65. Title:Resistance to *Meloidogyne incognita* in Ethiopian *Coffea arabica* accessions

View Article: Euphytica. 118 (1). 2001. 1-8

CD Volume:370

Print Article: Pages: 1-8

Author(s):Anzueto F Bertrand B Sarah J L Eskes A B Decazy B

Author Affiliation:IICA, 2200, Coronado, San Jose

Language:English

Language of Summary:English (EN)

Abstract: The *Meloidogyne incognita* nematode is a destructive, widespread pathogen of *Coffea arabica* varieties in Guatemala and in other coffee production countries. Nematode resistant Robusta (*Coffea canephora*) is frequently used as a rootstock; however, as it is not adapted to high altitudes, this is an inadequate solution. Arabica varieties resistant to the nematode would avoid the need for grafting at altitudes of more than 800-1 000 m. Trials were carried out to test the response to an *M. incognita* isolate from Guatemala on; 50 semi-wild Ethiopian and Sudanese accessions, 20 F1 hybrid families obtained by crossing eight accessions with three susceptible varieties and five F2 populations. An additional trial was conducted to compare resistance to the Guatemalan nematode isolate with a *M. incognita* isolate from Brazil. The inoculum doses was 1 000 + 200 eggs for each 2-3 month old coffee seedling, and the number of egg masses per plant was observed. Resistance to *M. incognita* observed in the Ethiopian accessions was important, as 40% of the accessions tested were totally resistant. Resistance was dominant in F1 and transmitted to the F2 generations. Segregation in the F2 populations indicated the presence of a single dominant gene for some crosses and two complementary dominant genes for others. The reactions of the Ethiopian accessions to the Brazilian isolate of *M. incognita* were similar to those of the Guatemalan isolate. These results confirm the necessity of widening the genetic base of *C. arabica* breeding populations using semi-wild Ethiopian trees as a source of resistance to *M. incognita*

Descriptors: plant breeding. Horticulture (Agriculture); Pest Assessment Control and Management; Population Genetics (Population Studies)

Geographic Locator: Ethiopia (Ethiopian region)

Organism Descriptors: *Coffea arabica* [coffee] (Rubiaceae): host, plantation crop, semi-wild trees; *Coffea canephora* [robusta coffee] (Rubiaceae): host, plantation crop; *Meloidogyne incognita* (Nematoda): plant parasite

Supplemental Descriptors: Nematoda: Aschelminthes, Helminthes, Invertebrata, Animalia; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae.

Angiosperms; Animals; Aschelminths; Dicots; Helminths; Invertebrates; Plants; Spermatophytes; Vascular Plants

Subject Codes: Horticulture (Agriculture); Pest Assessment Control and Management; Population Genetics (Population Studies)

ISSN: 0014-2336

Year: 2001

Journal Title: *Euphytica*

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70. Title: Genetic diversity of wild coffee (*Coffea arabica* L.) using molecular markers

View Article: *Euphytica*. 118 (1). 2001. 53-65

CD Volume: 370

Print Article: Pages: 53-65

Author(s): Anthony F Bertrand B Quiros O Wilches A Lashermes P Berthaud J Charrier A

Author Affiliation: CATIE, 7170, Turrialba

Language: English

Language of Summary: English (EN)

Abstract: Genetic diversity was studied using RAPD markers among 119 coffee (*Coffea arabica* L.) individuals representing 88 accessions derived from spontaneous and subsponaneous trees in Ethiopia, the primary centre of species diversity, six cultivars grown locally in Ethiopia, and two accessions derived from the genetic populations *Typica* and *Bourbon*, spread in the 18th century, which gave rise to the most currently grown cultivars. Twenty-nine polymorphic fragments were used to calculate a similarity index and construct dendrograms. The Ethiopian material was separated from the *Typica*- and *Bourbon*-derived accessions and classified in four groups: one with most of the collected material from southwestern Ethiopia and three from southern and southeastern Ethiopia. Almost all detected diversity was found in the southwestern group while the southern and southeastern groups presented only 59% of identified markers. The genetic distances were low between the southwestern group and the

southern and southeastern groups, and between the southwestern group and the Typica- and Bourbon-derived accessions. The cultivated coffee derived from the genetic populations Typica and Bourbon appeared little differentiated from wild coffee growing in the southwest. The results supported the hypothesis that southwestern Ethiopian coffee trees could have been introduced recently in the south and southeast. A separate analysis of the 80 accessions classified in the southwestern group allowed identifying particular spontaneous- and subspontaneous-derived accessions and redundancies in the collected material from southwestern Ethiopia. RAPD markers did not detect any within-collection polymorphism except for two trees that were identified as off-types in the CATIE field genebank

Descriptors:plant breeding. Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

Geographic Locator:Ethiopia (Ethiopian region)

Organism Descriptors:Coffea arabica [arabica coffee] (Rubiaceae): genetic diversity, wild trees

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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71. Title:Resistance of Coffea arabica cv. Ruiru 11 tested with different isolates of Colletotrichum kahawae, the causal agent of coffee berry disease

View Article: Euphytica. 121 (1). 2001. 19-24

CD Volume:370

Print Article: Pages: 19-24

Author(s):Omondi C O Ayiecho P O Mwang'ombe A W Hindorf H

Author Affiliation:Coffee Research Foundation, Ruiru

Language:English

Language of Summary:English (EN)

Abstract:Seven single conidia isolates of Colletotrichum kahawae varying in pathogenicity were used to inoculate hybrid progenies from 66 crosses of Coffea arabica cv. Ruiru 11. The objective of this study was to investigate the effect of pathogen variation on resistance of the Ruiru 11 cultivar. The main effects of crosses and isolates were significant ( $p < 0.05$ ) while their interaction effects were non-significant. Partitioning variance components indicated that the proportion of phenotypic variance for resistance that is due to genetic effects was low. It was concluded that variation for resistance among hybrid progenies of the Ruiru 11 cultivar was probably due to differences in aggressiveness of the pathogen as reflected by the significant main effects of crosses and isolates in combination with other environmental factors which influence disease epidemics. The coffee berry disease pathogen is unlikely to have adapted to the cultivar because of the non-significant crossesXisolates interaction effects

Descriptors:disease resistance; genetic effect; hybridization; pathogenicity; phenotypic variance; plant breeding; race variation. Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management. coffee berry disease: fungal disease

Organism Descriptors:Coffea arabica [coffee] (Rubiaceae): cultivar-Ruiru 11, host, plantation crop; Colletotrichum kahawae (Fungi Imperfecti or Deuteromycetes): phytopathogen

Supplemental Descriptors:Fungi Imperfecti or Deuteromycetes: Fungi, Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes:Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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72. Title:Caffeine, trigonelline, chlorogenic acids and sucrose diversity in wild *Coffea arabica* L. and *C. canephora* P. accessions

View Article: Food Chemistry. 75 (2). November, 2001. 223-230

CD Volume:377

Print Article: Pages: 223-230

Author(s):Ky C L Louarn J Dussert S Guyot B Hamon S Noirot M

Author Affiliation:Centre IRD, 911 Avenue Agropolis, 34032, Montpellier Cedex, 1: noirot@mpl.ird.fr

Language:English

Language of Summary:English (EN)

Abstract:Numerous aroma precursor evaluations have been undertaken with green coffee beans of both species of worldwide economic importance: *Coffea arabica* L. and *Coffea canephora* P. Efforts have been made to characterise cultivars of these two species. The originality of this study is to present the biochemical diversity of wild accessions originating from Ethiopia and Kenya for *C. arabica* (38 genotypes) and from five African countries (Cote d'Ivoire, Guinea, Congo, Cameroon and Central African Republik) for *C. canephora* (38 genotypes). The biochemical aroma parameters assessed by HPLC analysis were: (1) the two alkaloids, caffeine and trigonelline, (2) chlorogenic acids and (3) sucrose. Results reveal that the two species showed significant accession differences for all compounds. Between-species-average-content comparison confirms that *C. arabica* showed more trigonelline and sucrose and that *C. canephora* presented more CGA and caffeine. *C. canephora* diversity was higher than that of *C. arabica*, except for trigonelline and sucrose. For *C. canephora*, results showed that: (1) no differences were highlighted between accessions for countries of origin for the alkaloids and sucrose, and (2) the 3-CQA content allowed to accessions to be pooled into two groups

Descriptors:biochemical diversity; coffee: beverage. Foods; Population Studies. caffeine: alkaloid, aroma parameter; chlorogenic acids; sucrose; trigonelline: alkaloid, aroma parameter

Organism Descriptors:*Coffea arabica* [coffee] (Rubiaceae): Ethiopia, Kenya, wild; *Coffea canephora* [coffee] (Rubiaceae): Cameroon, Central African Republic, Congo, Guinea, Ivory Coast, wild accessions

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods; Population Studies

ISSN:0308-8146

Year:2001

Journal Title:Food Chemistry

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73. Title:Breeding for resistance to *Meloidogyne exigua* in *Coffea arabica* by introgression of resistance genes of *Coffea canephora*

View Article: Plant Pathology. 2001. 50 (5). 637-643

CD Volume:372

Print Article: Pages: 637-643

Author(s):Bertrand B Anthony F Lashermes P

Author Affiliation:IICA/PROMECAFE, CIRAD Centre de Cooperation Internationale en Recherches Agronomiques pour le Developpement, Ap. Postal 55, 2200, Coronado, Costa Rica

Language:English

Abstract:Breeding for resistance to root-knot nematode *Meloidogyne exigua* in coffee may help in controlling this nematode, which causes substantial harvest losses throughout Latin America. Accessions of *Coffea arabica*, *C. canephora* and lines derived from the Timor Hybrid (wild *C. arabica* x *C. canephora* interspecific hybrid) were tested in a greenhouse for resistance to gall

formation by counting individual galls on the roots of plants inoculated with second-stage juveniles of a *M. exigua* population from Costa Rica. The level of introgression from *C. canephora* was also assessed on 28 resistant and susceptible genotypes in a molecular study with amplified fragment length polymorphism (AFLP) markers. The frequency of resistant plants was very low or even nonexistent in *C. arabica* and very high in *C. canephora* with >78% immune plants and 100% resistant plants. Several lines derived from the interspecific hybrid revealed a high level of resistance similar to that observed in the parent *C. canephora* species. A molecular study of Timor Hybrid-derived lines revealed high variability for the number of markers present in the study genotypes. A larger number of introgression markers was found in the group of resistant genotypes than in the susceptible genotypes. However, there were also lines with little introgression that had retained resistance. Based on genetic distances calculated from these markers, two groups of lines were revealed: those derived from Timor Hybrid CIFC1343, and those derived from Timor Hybrids CIFC832/1 and CIFC832/2, which may indicate the existence of different resistance genes in the two groups. The segregations observed in F1 and F2 progeny may be explained by at least a dominant gene. The lines derived from the Timor Hybrid are a worthwhile source of resistance to *M. exigua* that can be exploited to improve *C. arabica* with the help of molecular-assisted selection

Descriptors:coffee. galls. genes. genetic-distance. genetic-markers. hybrids. introgression. lines. nematode-juveniles. pest-resistance. plant-parasitic-nematodes. plant-pests. progeny. roots. segregation. selective-breeding

Organism Descriptors:Coffea. Coffea-arabica. Coffea-canephora. Meloidogyne-exigua. Nematoda

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Meloidogyne. Meloidogynidae. Nematoda. invertebrates. animals

Subject Codes:FF003. FF020. FF620. HH600. WW000

Supplementary Info:32 ref

ISSN:0032-0862

Year:2001

Journal Title:Plant Pathology

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74. Title:Molecular and biochemical characterization of endo- beta -mannanases from germinating coffee (*Coffea arabica*) grains

View Article: Planta. 2001. 213 (2). 296-308

CD Volume:355

Print Article: Pages: 296-308

Author(s):Marraccini P Rogers W J Allard C Andre M L Caillet V Lacoste N Lausanne F Michaux S

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Language:English

Abstract:The activity of endo- beta -mannanase ([1 right arrow 4]- beta -mannan endohydrolase, EC 3.2.1.78) is likely to be central to the metabolism of cell wall mannans during the germination of grains of coffee (*Coffea* spp.). In the present paper, we report the cloning and sequencing of two endo- beta -mannanase cDNAs (*manA* and *manB*) by different strategies from *Coffea arabica*. The *manA* cDNA was obtained by the use of oligonucleotides homologous to published sequences of other endo- beta -mannanases and *manB* by the use of oligonucleotides deduced from a purified enzyme from coffee. *ManA* and *B* proteins share about 56% sequence homology and include highly conserved regions found in other mannan endohydrolases. Purification of the activity by chromatography followed by separation by two-dimensional electrophoresis and amino acid sequencing demonstrated the existence of at least seven isomers of the *ManB* form. The existence of multiple *manB* genes was also indicated by Southern analysis, whereas only one or two gene copies were detected for *manA*. Northern hybridizations with *manA*- and *manB*-specific probes showed that mRNA transcripts for both cDNAs were present at the same periods of bean germination with

transcript peaks at 20 days after imbibition of water (DAI). Transcripts were not detected during grain maturation or in the other tissues such as roots, stems, flowers and leaves. The peak endo- beta -mannanase activity occurred at approximately 28 DAI and was not detected in grains prior to imbibition. Activity and mRNA levels appeared to be tightly coordinated. Tests of substrate specificity with the purified ManB enzyme showed that activity required a minimum of five mannose units to function efficiently  
Descriptors:coffee. complementary-DNA. DNA-cloning. DNA-sequencing. enzyme-activity. enzymes. genes. isomers. mannans. mannose. messenger-RNA  
Identifiers:mannan endo-1,4-beta-mannosidase  
Organism Descriptors:Coffea. Coffea-arabica  
Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes:FF003. FF020. FF060. WW000  
Supplementary Info:43 ref  
ISSN:0032-0935  
Year:2001  
Journal Title:Planta  
Copyright:Copyright CAB International

75. Title:Trigonelline inheritance in the interspecific Coffea pseudozanguebariae x C. liberica var. dewevrei cross  
View Article: Theoretical and Applied Genetics. 2001. 102 (4). 630-634  
CD Volume:373  
Print Article: Pages: 630-634  
Author(s):Ky C L Guyot B Louarn J Hamon S Noirot M  
Author Affiliation:UMR 1097 - Diversite et genome des plantes cultivees IRD, GeneTrop, 911 Avenue Agropolis, B.P. 5045, 34032 Montpellier Cedex 1, France  
Language:English  
Abstract:Trigonelline alkaloid is present in coffee beans, and during roasting, it gives rise to the major coffee aroma compounds (several alkyl-pyridines and pyrroles). In this study we investigated the genetic inheritance of trigonelline accumulation in green beans in an interspecific cross between a wild east African species, C. pseudozanguebariae (PSE) and the west African species C. liberica var. dewevrei (DEW). Trigonelline content was measured by HPLC in both parental species, F1 hybrids and the reciprocal backcross hybrids (BCDEW and BCPSE). The results showed that, on the average, PSE accumulated twice as much trigonelline as DEW. No year effect or interaction (genotype x year) was recorded. Trigonelline showed high heritability (71%), which meant that the genotypic value could be easily estimated from the phenotypic value. However, the fact that this trait was not additive suggested the possibility of nucleocytoplasmic inheritance. This hypothesis was confirmed by: (1) similar levels of trigonelline content in the PSE, F1, BCPSE and BCDEW groups, all having the same maternal cytoplasm, and (2) the location of one nuclear QTL on the G linkage group  
Descriptors:chemical-composition. coffee. hybrids. inheritance. interactions. linkage. plant-composition. quantitative-trait-loci. trigonelline. nucleocytoplasmic-interaction. interspecific-hybridization. genetics. wild-relatives  
Identifiers:Coffea pseudozanguebariae  
Organism Descriptors:Coffea. Coffea-liberica  
Supplemental Descriptors:Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes:FF003. FF020. FF040  
Supplementary Info:18 ref  
ISSN:0040-5752  
Year:2001  
Journal Title:Theoretical and Applied Genetics  
Copyright:Copyright CAB International

76. Title:Photosynthetic acclimation to high light conditions in mature leaves of Coffea arabica L.: role of xanthophylls, quenching mechanisms and nitrogen nutrition

View Article: Australian Journal of Plant Physiology. 2000. 27 (1). 43-51

CD Volume:324

Print Article: Pages: 43-51

Author(s):Ramalho J C Pons T L Groeneveld H W Azinheira H G Nunes M A

Author Affiliation:Instituto de Investigacao Cientifica Tropical, CEPTA, Tapada da Ajuda, Ap. 3014, P-1301 Lisboa Codex, Portugal

Language:English

Abstract:In greenhouse and field trials in the Netherlands and Portugal, 1.5- to 2-year-old arabica coffee plants (cv. Catuai), originally from a shaded habitat, were separated in 3 groups to be grown under different levels of N

fertilization: 0.3 mmol N supplements were given to the soil every 7 days (high N treatment, 2N), every 15 days (medium N treatment, 1N) and every 45 days (low N treatment, 0N). These plants were later exposed to a high sunlight irradiance (noon PPFD up to 1500 micro mol m<sup>-2</sup> s<sup>-1</sup>) for a period of 12 or 15 days. Among others, the values of electron transport capacity, maximum carboxylation activity, photosynthetic capacity (A<sub>max</sub>) and several fluorescence parameters (F<sub>v</sub>/F<sub>m</sub>, F<sub>v</sub>'/F<sub>m</sub>', qP, phi e) first showed a reduction (until the 4th-7th day) in all N treatments, followed by an N-dependent recovery. The 2N plants were less affected in the first few days and, at the end of the stress period, showed a better recovery for most of the studied parameters and the highest increase in the saturating PPFD for net photosynthesis and A<sub>max</sub>. The present work shows that the ability to acclimatize displayed by the mature leaves of 2N plants was accompanied by an increase in energy dissipation mechanisms. These include an increase in the 'high energy' quenching and, mostly, the presence of higher contents of some xanthophylls (zeaxanthin and lutein) and carotenes, which helped to decrease the energetic overcharge in the photosystems. Pigment changes in mature leaves suggest that N can promote specific mechanisms of acclimatization others than those that might be expected from a preferential partition of the element N into photosynthetic components

Descriptors:nitrogen. plant-nutrition. xanthophylls. carotenes. coffee. electron-transfer. fluorescence. xanthophyll. photosynthesis. solar-radiation. supplements. zeaxanthin. light-intensity. stimulant-plants

Geographic Locator:Netherlands. Portugal

Organism Descriptors:Coffea-arabica. Coffea

Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. Western-Europe. Europe. Developed-Countries. Benelux. European-Union-Countries. OECD-Countries. Southern-Europe. Mediterranean-Region

Subject Codes:FF003. FF061. FF900. FF060

Supplementary Info:43 ref

ISSN:0310-7841

Year:2000

Journal Title:Australian Journal of Plant Physiology

Copyright:Copyright CAB International

77. Title:Potent odorants of raw Arabica coffee. Their changes during roasting

View Article: Journal of Agricultural and Food Chemistry. 48 (3). March, 2000. 868-872

CD Volume:301

Print Article: Pages: 868-872

Author(s):Czerny Michael Grosch Werner

Author Affiliation:Deutsche Forschungsanstalt fuer Lebensmittelchemie, Lichtenbergstrasse 4, D-85748, Garching

Language:English

Language of Summary:English (EN)

Abstract:Aroma extract dilution analysis of raw Arabica coffee revealed 3-isobutyl-2-methoxypyrazine (I), 2-methoxy-3,5-dimethylpyrazine (II), ethyl 2-methylbutyrate (III), ethyl 3-methylbutyrate (IV), and 3-isopropyl-2-

methoxypyrazine (V) as potent odorants. The highest odor activity value was found for I followed by II, IV, and V. It was concluded that I was responsible for the characteristic, peasy odor note of raw coffee. Twelve odorants occurring in raw coffee and (E)-beta-damascenone were also quantified after roasting. The concentration of I did not change, whereas methional, 3-hydroxy-4,5-dimethyl-2(5H)-furanone, vanillin, (E)-beta-damascenone, and 4-vinyl- and 4-ethylguaiacol increased strongly during the roasting process

Descriptors:raw Arabica coffee: roasting effect. Biochemistry and Molecular Biophysics; Foods. (E)-beta-damascenone; 2-methoxy-3,5-dimethylpyrazine; 3-hydroxy-4,5-dimethyl-2(5H)-furanone; 3-isobutyl-2-methoxypyrazine; 3-isopropyl-2-methoxypyrazine; 4-ethylguaiacol; 4-vinylguaiacol; ethyl 2-methylbutyrate; ethyl 3-methylbutyrate; methional; odorant: potency; vanillin

Subject Codes:Biochemistry and Molecular Biophysics; Foods

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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78. Title:Molecular analysis of introgressive breeding in coffee (*Coffea arabica* L.)

View Article: Theoretical and Applied Genetics. 2000. 100 (1). 139-146

CD Volume:335

Print Article: Pages: 139-146

Author(s):Lashermes P Andrzejewski S Bertrand B Combes M C Dussert S Graziosi G Trouslot P Anthony F

Author Affiliation:IRD (ex ORSTOM), GeneTrop, BP 5045, F-34032 Montpellier, France

Language:English

Abstract:Nineteen arabica coffee introgression lines (BC1F4) and two accessions derived from a spontaneous interspecific cross (i.e. Timor Hybrid (TH)) between *Coffea arabica* ( $2n = 4x = 44$ ) and *C. canephora* ( $2n = 2x = 22$ ) were analysed for the introgression of *C. canephora* genetic material. TH-derived genotypes were evaluated by amplified fragment length polymorphism (AFLP), using 42 primer combinations, and compared to 23 accessions of *C. arabica* and 8 accessions of *C. canephora*. A total of 1062 polymorphic fragments were scored among the 52 accessions analysed. Some 178 markers consisting of 109 additional bands (i.e. introgressed markers) and 69 missing bands distinguished the group composed of the TH-derived genotypes from the accessions of *C. arabica*. AFLP therefore seemed to be an extremely efficient technique for DNA marker generation in coffee as well as for the detection of introgression in *C. arabica*. The genetic diversity observed in the TH-derived genotypes appeared to be approximately double that in *C. arabica*. Although representing only a small proportion of the genetic diversity available in *C. canephora*, TH obviously constitutes a considerable source of genetic diversity for arabica breeding. Analysis of genetic relationships among TH-derived genotypes suggested that introgression was not restricted to chromosome substitution but also involved chromosome recombinations. Furthermore, TH-derived genotypes varied considerably in the number of AFLP markers attributable to introgression. In this way, the introgressed markers identified in the analysed arabica coffee introgressed genotypes were estimated to represent from 9 to 29% of the *C. canephora* genome. Nevertheless, the amount of alien genetic material in the introgression arabica lines remains substantial and should justify the development of adapted breeding strategies

Descriptors:coffee. genetic-diversity. interspecific-hybridization.

introgression. genetic-markers. chromosome-substitution. recombination. plant-breeding. stimulant-plants. biotechnology

Identifiers:amplified fragment length polymorphism

Organism Descriptors:*Coffea-canephora*. *Coffea-arabica*. *Coffea*

Supplemental Descriptors:*Coffea*. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants

Subject Codes:FF003. FF020. WW000



Supplementary Info:29 ref  
ISSN:0040-5752  
Year:2000  
Journal Title:Theoretical and Applied Genetics  
Copyright:Copyright CAB International

79. Title:The impact of close spacing on yield of arabica coffee under contrasting agro- ecologies of Ethiopia  
View Article: African Crop Science Journal. 2001. 9 (2). 401-409  
CD Volume:352  
Print Article: Pages: 401-409  
Author(s):Kufa T Shimber T Yilma A Netsere A Taye E  
Author Affiliation:Ethiopian Agricultural Research Organisation, Jima National Coffee Research Centre, P.O. Box 192, Jima, Ethiopia  
Language:English  
Language of Summary:English. French  
Abstract:In an attempt to investigate the efficiency of close spacing and determine the optimum density for the approved coffee berry disease (CBD) resistant selections, field experiments were conducted at Tepi, Wenago, and Gera Research Centers for eleven consecutive years (1988/89-1998/99). A randomised complete block design was used to assign seven population densities that ranged between 4,006 and 10,000 trees ha<sup>-1</sup>. Coffee yield results of seven years revealed significant yield responses to close spacing in different crop seasons at each site, specifically when the trees bore heavy crops. Subsequently, coffee yield increased with increasing population densities, though the magnitude varied across crop years and locations. The combined analysis of variance at Wenago and Tepi showed non-significant yield difference, but differences were highly significant at Gera. The interactions of crop season and spacing were also significant at Tepi and Gera, but this was not the case at Wenago. At Tepi, yield initially increased with increasing tree populations up to the fifth crop but, thereafter, tended to decrease above the population densities of 7,062 trees ha<sup>-1</sup>, at hot and humid agroecology indicating early mutual shading effects. In contrast, in medium (Wenago) and high altitude (Gera) areas, yield increased from 13.22 to 21.84 and 17.05 to 25.84 Q ha<sup>-1</sup>, respectively, with increasing population density from 4,006 to 9,066 trees ha<sup>-1</sup>. Such impacts of close spacing on coffee yield performances were largely associated with the prevailing climatic factors that determined the rate of vegetative growth and subsequent adverse mutual shading effects  
Geographic Locator:Ethiopia  
Organism Descriptors:Coffea-arabica  
Supplemental Descriptors:East-Africa. Africa-South-of-Sahara. Africa. Least-Developed-Countries. Developing- Countries. ACP-Countries  
ISSN:1021-9730  
Year:2001  
Journal Title:African Crop Science Journal

80. Title:Resistance to Meloidogyne incognita in Ethiopian Coffea arabica accessions  
View Article: Euphytica. 118 (1). 2001. 1-8  
CD Volume:370  
Print Article: Pages: 1-8  
Author(s):Anzueto F Bertrand B Sarah J L Eskes A B Decazy B  
Author Affiliation:IICA, 2200, Coronado, San Jose  
Language:English  
Language of Summary:English (EN)  
Abstract:The Meloidogyne incognita nematode is a destructive, widespread pathogen of Coffea arabica varieties in Guatemala and in other coffee production countries. Nematode resistant Robusta (Coffea canephora) is frequently used as a rootstock; however, as it is not adapted to high altitudes, this is an inadequate solution. Arabica varieties resistant to the nematode would avoid the need for grafting at altitudes of more than 800-1 000 m. Trials were carried out

to test the response to an *M. incognita* isolate from Guatemala on; 50 semi-wild Ethiopian and Sudanese accessions, 20 F1 hybrid families obtained by crossing eight accessions with three susceptible varieties and five F2 populations. An additional trial was conducted to compare resistance to the Guatemalan nematode isolate with a *M. incognita* isolate from Brazil. The inoculum doses was 1 000 + 200 eggs for each 2-3 month old coffee seedling, and the number of egg masses per plant was observed. Resistance to *M. incognita* observed in the Ethiopian accessions was important, as 40% of the accessions tested were totally resistant. Resistance was dominant in F1 and transmitted to the F2 generations. Segregation in the F2 populations indicated the presence of a single dominant gene for some crosses and two complementary dominant genes for others. The reactions of the Ethiopian accessions to the Brazilian isolate of *M. incognita* were similar to those of the Guatemalan isolate. These results confirm the necessity of widening the genetic base of *C. arabica* breeding populations using semi-wild Ethiopian trees as a source of resistance to *M. incognita*

Descriptors:plant breeding. Horticulture (Agriculture); Pest Assessment Control and Management; Population Genetics (Population Studies)

Geographic Locator:Ethiopia (Ethiopian region)

Organism Descriptors:Coffea arabica [coffee] (Rubiaceae): host, plantation crop, semi-wild trees; Coffea canephora [robusta coffee] (Rubiaceae): host, plantation crop; Meloidogyne incognita (Nematoda): plant parasite

Supplemental Descriptors:Nematoda: Aschelminthes, Helminthes, Invertebrata, Animalia; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Animals; Aschelminths; Dicots; Helminths; Invertebrates; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Pest Assessment Control and Management; Population Genetics (Population Studies)

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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81. Title:Genetic diversity of wild coffee (*Coffea arabica* L.) using molecular markers

View Article: Euphytica. 118 (1). 2001. 53-65

CD Volume:370

Print Article: Pages: 53-65

Author(s):Anthony F Bertrand B Quiros O Wilches A Lashermes P Berthaud J Charrier A

Author Affiliation:CATIE, 7170, Turrialba

Language:English

Language of Summary:English (EN)

Abstract:Genetic diversity was studied using RAPD markers among 119 coffee (*Coffea arabica* L.) individuals representing 88 accessions derived from spontaneous and subspontaneous trees in Ethiopia, the primary centre of species diversity, six cultivars grown locally in Ethiopia, and two accessions derived from the genetic populations Typica and Bourbon, spread in the 18th century, which gave rise to the most currently grown cultivars. Twenty-nine polymorphic fragments were used to calculate a similarity index and construct dendrograms. The Ethiopian material was separated from the Typica- and Bourbon-derived accessions and classified in four groups: one with most of the collected material from southwestern Ethiopia and three from southern and southeastern Ethiopia. Almost all detected diversity was found in the southwestern group while the southern and southeastern groups presented only 59% of identified markers. The genetic distances were low between the southwestern group and the southern and southeastern groups, and between the southwestern group and the Typica- and Bourbon-derived accessions. The cultivated coffee derived from the genetic populations Typica and Bourbon appeared little differentiated from wild coffee growing in the southwest. The results supported the hypothesis that southwestern Ethiopian coffee trees could have been introduced recently in the south and southeast. A separate analysis of the 80 accessions classified in the

southwestern group allowed identifying particular spontaneous- and subspontaneous-derived accessions and redundancies in the collected material from southwestern Ethiopia. RAPD markers did not detect any within-collection polymorphism except for two trees that were identified as off-types in the CATIE field genebank

Descriptors:plant breeding. Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

Geographic Locator:Ethiopia (Ethiopian region)

Organism Descriptors:Coffea arabica [arabica coffee] (Rubiaceae): genetic diversity, wild trees

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Horticulture (Agriculture); Molecular Genetics (Biochemistry and Molecular Biophysics)

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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82. Title:Resistance of Coffea arabica cv. Ruiru 11 tested with different isolates of Colletotrichum kahawae, the causal agent of coffee berry disease

View Article: Euphytica. 121 (1). 2001. 19-24

CD Volume:370

Print Article: Pages: 19-24

Author(s):Omondi C O Ayiecho P O Mwang'ombe A W Hindorf H

Author Affiliation:Coffee Research Foundation, Ruiru

Language:English

Language of Summary:English (EN)

Abstract:Seven single conidia isolates of Colletotrichum kahawae varying in pathogenicity were used to inoculate hybrid progenies from 66 crosses of Coffea arabica cv. Ruiru 11. The objective of this study was to investigate the effect of pathogen variation on resistance of the Ruiru 11 cultivar. The main effects of crosses and isolates were significant ( $p < 0.05$ ) while their interaction effects were non-significant. Partitioning variance components indicated that the proportion of phenotypic variance for resistance that is due to genetic effects was low. It was concluded that variation for resistance among hybrid progenies of the Ruiru 11 cultivar was probably due to differences in aggressiveness of the pathogen as reflected by the significant main effects of crosses and isolates in combination with other environmental factors which influence disease epidemics. The coffee berry disease pathogen is unlikely to have adapted to the cultivar because of the non-significant crosses X isolates interaction effects

Descriptors:disease resistance; genetic effect; hybridization; pathogenicity; phenotypic variance; plant breeding; race variation. Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management. coffee berry disease: fungal disease

Organism Descriptors:Coffea arabica [coffee] (Rubiaceae): cultivar-Ruiru 11, host, plantation crop; Colletotrichum kahawae (Fungi Imperfecti or Deuteromycetes): phytopathogen

Supplemental Descriptors:Fungi Imperfecti or Deuteromycetes: Fungi, Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes:Genetics; Horticulture (Agriculture); Infection; Pest Assessment Control and Management

ISSN:0014-2336

Year:2001

Journal Title:Euphytica

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83. Title:Caffeine, trigonelline, chlorogenic acids and sucrose diversity in wild *Coffea arabica* L. and *C. canephora* P. accessions

View Article: Food Chemistry. 75 (2). November, 2001. 223-230

CD Volume:377

Print Article: Pages: 223-230

Author(s):Ky C L Louarn J Dussert S Guyot B Hamon S Noiro M

Author Affiliation:Centre IRD, 911 Avenue Agropolis, 34032, Montpellier Cedex, 1: noiro M@mpl.ird.fr

Language:English

Language of Summary:English (EN)

Abstract:Numerous aroma precursor evaluations have been undertaken with green coffee beans of both species of worldwide economic importance: *Coffea arabica* L. and *Coffea canephora* P. Efforts have been made to characterise cultivars of these two species. The originality of this study is to present the biochemical diversity of wild accessions originating from Ethiopia and Kenya for *C. arabica* (38 genotypes) and from five African countries (Cote d'Ivoire, Guinea, Congo, Cameroon and Central African Republic) for *C. canephora* (38 genotypes). The biochemical aroma parameters assessed by HPLC analysis were: (1) the two alkaloids, caffeine and trigonelline, (2) chlorogenic acids and (3) sucrose. Results reveal that the two species showed significant accession differences for all compounds. Between-species-average-content comparison confirms that *C. arabica* showed more trigonelline and sucrose and that *C. canephora* presented more CGA and caffeine. *C. canephora* diversity was higher than that of *C. arabica*, except for trigonelline and sucrose. For *C. canephora*, results showed that: (1) no differences were highlighted between accessions for countries of origin for the alkaloids and sucrose, and (2) the 3-CQA content allowed to accessions to be pooled into two groups

Descriptors:biochemical diversity; coffee: beverage. Foods; Population Studies. caffeine: alkaloid, aroma parameter; chlorogenic acids; sucrose; trigonelline: alkaloid, aroma parameter

Organism Descriptors:*Coffea arabica* [coffee] (Rubiaceae): Ethiopia, Kenya, wild; *Coffea canephora* [coffee] (Rubiaceae): Cameroon, Central African Republic, Congo, Guinea, Ivory Coast, wild accessions

Supplemental Descriptors:Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods; Population Studies

ISSN:0308-8146

Year:2001

Journal Title:Food Chemistry

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84. Title:Optimizing headspace temperature and time sampling for identification of volatile compounds in ground roasted Arabica coffee

View Article: Journal of Agricultural and Food Chemistry. 49 (3). March, 2001. 1364-1369

CD Volume:367

Print Article: Pages: 1364-1369

Author(s):Sanz Cristina Ansorena Diana Bello Jose Cid Concepcion

Author Affiliation:Departamento de Bromatologia, Tecnologia de Alimentos y Toxicologia, Facultad de Farmacia, Universidad de Navarra, 31080, Pamplona: ccid@unav.es

Language:English

Language of Summary:English (EN)

Abstract:Equilibration time and temperature were the factors studied to choose the best conditions for analyzing volatiles in roasted ground Arabica coffee by a static headspace sampling extraction method. Three temperatures of equilibration were studied: 60, 80, and 90 degreeC. A larger quantity of volatile compounds was extracted at 90 degreeC than at 80 or 60 degreeC, although the same qualitative profile was found for each. The extraction of the volatile compounds was studied at seven different equilibration times: 30, 45, 60, 80, 100, 120, and 150 min. The best time of equilibration for headspace

analysis of roasted ground Arabica coffee should be selected depending on the chemical class or compound studied. One hundred and twenty-two volatile compounds were identified, including 26 furans, 20 ketones, 20 pyrazines, 9 alcohols, 9 aldehydes, 8 esters, 6 pyrroles, 6 thiophenes, 4 sulfur compounds, 3 benzenic compounds, 2 phenolic compounds, 2 pyridines, 2 thiazoles, 1 oxazole, 1 lactone, 1 alkane, 1 alkene, and 1 acid

Descriptors:ground roasted Arabica coffee: beverage; headspace temperature.

Foods; Methods and Techniques. volatile compounds: identification

Subject Codes:Foods; Methods and Techniques

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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85. Title:Chemical characterization of the high molecular weight material

extracted with hot water from green and roasted arabica coffee

View Article: Journal of Agricultural and Food Chemistry. 49 (4). April, 2001.

1773-1782

CD Volume:367

Print Article: Pages: 1773-1782

Author(s):Nunes Fernando M Coimbra Manuel A

Author Affiliation:Departamento de Quimica, Universidade de Aveiro, 3810-193,

Aveiro: mac@dq.ua.pt

Language:English

Language of Summary:English (EN)

Abstract:The polysaccharides present in coffee infusions are known to contribute to the organoleptic characteristics of the drink, such as the creamy sensation perceived in the mouth known as "body", the release of aroma substances, and the stability of espresso coffee foam. To increase the knowledge about the origin, composition, and structure of the polysaccharide fraction, the high molecular weight material (HMWM) was extracted with hot water from two green and roasted ground arabica coffees: Costa Rica (wet processed) and Brazil (dry processed). The polysaccharides present in the green coffees HMWM were arabinogalactans (62%), galactomannans (24%), and glucans, and those found in roasted coffees were galactomannans (69%) and arabinogalactans (28%). The polysaccharides of the HMWM of the roasted coffees were less branched than those of the green coffees. The major green coffee proteins had molecular weights of 58 and 38 kDa, and the 58 kDa protein had two subunits, of 38 and 20 kDa, possibly linked by disulfide bonds. The protein fraction obtained from roasted coffees had only, a defined band with 14 kDa and a diffuse band with >200 kDa. The majority of the galactomannans were precipitated with solutions of 50% ethanol, and the size-exclusion chromatography of the roasted fractions showed coelution of polysaccharides, proteins, phenolics, and brown compounds. The use of strong hydrogen and hydrophobic dissociation conditions allowed us to conclude that the phenolics and brown compounds were linked by covalent bonds to the polymeric material

Descriptors:green coffee: coffee; roasted arabica coffee: coffee. Biochemistry

and Molecular Biophysics; Foods. arabinogalactans; brown compounds;

galactomannans; glucans; high molecular weight material hot water extract:

characterization; phenolics; polysaccharides; proteins

Subject Codes:Biochemistry and Molecular Biophysics; Foods

ISSN:0021-8561

Year:2001

Journal Title:Journal of Agricultural and Food Chemistry

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86. Title:Breeding for resistance to *Meloidogyne exigua* in *Coffea arabica* by introgression of resistance genes of *Coffea canephora*

View Article: Plant Pathology. 2001. 50 (5). 637-643

CD Volume:372

Print Article: Pages: 637-643

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Language: English

Abstract: Breeding for resistance to root-knot nematode *Meloidogyne exigua* in coffee may help in controlling this nematode, which causes substantial harvest losses throughout Latin America. Accessions of *Coffea arabica*, *C. canephora* and lines derived from the Timor Hybrid (wild *C. arabica* x *C. canephora* interspecific hybrid) were tested in a greenhouse for resistance to gall formation by counting individual galls on the roots of plants inoculated with second-stage juveniles of a *M. exigua* population from Costa Rica. The level of introgression from *C. canephora* was also assessed on 28 resistant and susceptible genotypes in a molecular study with amplified fragment length polymorphism (AFLP) markers. The frequency of resistant plants was very low or even nonexistent in *C. arabica* and very high in *C. canephora* with >78% immune plants and 100% resistant plants. Several lines derived from the interspecific hybrid revealed a high level of resistance similar to that observed in the parent *C. canephora* species. A molecular study of Timor Hybrid-derived lines revealed high variability for the number of markers present in the study genotypes. A larger number of introgression markers was found in the group of resistant genotypes than in the susceptible genotypes. However, there were also lines with little introgression that had retained resistance. Based on genetic distances calculated from these markers, two groups of lines were revealed: those derived from Timor Hybrid CIFC1343, and those derived from Timor Hybrids CIFC832/1 and CIFC832/2, which may indicate the existence of different resistance genes in the two groups. The segregations observed in F1 and F2 progeny may be explained by at least a dominant gene. The lines derived from the Timor Hybrid are a worthwhile source of resistance to *M. exigua* that can be exploited to improve *C. arabica* with the help of molecular-assisted selection

Descriptors: coffee. galls. genes. genetic-distance. genetic-markers. hybrids. introgression. lines. nematode-juveniles. pest-resistance. plant-parasitic-nematodes. plant-pests. progeny. roots. segregation. selective-breeding  
Organism Descriptors: *Coffea*. *Coffea-arabica*. *Coffea-canephora*. *Meloidogyne-exigua*. Nematoda

Supplemental Descriptors: *Coffea*. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants. *Meloidogyne*. *Meloidogynidae*. Nematoda. invertebrates. animals

Subject Codes: FF003. FF020. FF620. HH600. WW000

Supplementary Info: 32 ref

ISSN: 0032-0862

Year: 2001

Journal Title: Plant Pathology

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87. Title: Molecular and biochemical characterization of endo- beta -mannanases from germinating coffee (*Coffea arabica*) grains

View Article: *Planta*. 2001. 213 (2). 296-308

CD Volume: 355

Print Article: Pages: 296-308

Author(s): Marraccini P Rogers W J Allard C Andre M L Caillet V Lacoste N Lausanne F Michaux S

Author Affiliation: Department of Plant Science, Nestle Research Centre, 101 Avenue Gustave-Eiffel, B.P.9716, 37097 Tours Cedex 2, France

Language: English

Abstract: The activity of endo- beta -mannanase ([1 right arrow 4]- beta -mannan endohydrolase, EC 3.2.1.78) is likely to be central to the metabolism of cell wall mannans during the germination of grains of coffee (*Coffea* spp.). In the present paper, we report the cloning and sequencing of two endo- beta -mannanase cDNAs (*manA* and *manB*) by different strategies from *Coffea arabica*. The *manA* cDNA was obtained by the use of oligonucleotides homologous to published

sequences of other endo- beta -mannanases and manB by the use of oligonucleotides deduced from a purified enzyme from coffee. ManA and B proteins share about 56% sequence homology and include highly conserved regions found in other mannan endohydrolases. Purification of the activity by chromatography followed by separation by two-dimensional electrophoresis and amino acid sequencing demonstrated the existence of at least seven isomers of the ManB form. The existence of multiple manB genes was also indicated by Southern analysis, whereas only one or two gene copies were detected for manA. Northern hybridizations with manA- and manB-specific probes showed that mRNA transcripts for both cDNAs were present at the same periods of bean germination with transcript peaks at 20 days after imbibition of water (DAI). Transcripts were not detected during grain maturation or in the other tissues such as roots, stems, flowers and leaves. The peak endo- beta -mannanase activity occurred at approximately 28 DAI and was not detected in grains prior to imbibition. Activity and mRNA levels appeared to be tightly coordinated. Tests of substrate specificity with the purified ManB enzyme showed that activity required a minimum of five mannose units to function efficiently

Descriptors:coffee. complementary-DNA. DNA-cloning. DNA-sequencing. enzyme-activity. enzymes. genes. isomers. mannans. mannose. messenger-RNA  
Identifiers:mannan endo-1,4-beta-mannosidase  
Organism Descriptors:Coffea. Coffea-arabica  
Supplemental Descriptors:Coffea. Rubiaceae. Rubiales. dicotyledons. angiosperms. Spermatophyta. plants  
Subject Codes:FF003. FF020. FF060. WW000  
Supplementary Info:43 ref  
ISSN:0032-0935  
Year:2001  
Journal Title:Planta  
Copyright:Copyright CAB International

88. Title:Productivity, microclimate and water use in *Grevillea robusta*-based agroforestry systems on hillslopes in semi-arid Kenya  
View Article: Agriculture, Ecosystems & Environment. 2000. 80 (1/2). 121-141  
CD Volume:325  
Print Article: Pages: 121-141  
Author(s):Ong C K Black C R Wallace J S Khan A A H Lott J E Jackson N A Howard S B Smith D M  
Author Affiliation:International Centre for Research in Agroforestry, PO Box 30677, Gigiri, Nairobi, Kenya  
Language:English  
Abstract:This paper describes a multi-disciplinary project to examine the changing interactions between trees and crops as the trees in semiarid agroforestry systems establish and mature; the project is one of the most detailed and highly instrumented long-term studies of tree and crop growth, system performance, resource capture, hydrology and microclimate ever carried out within an agroforestry context. Its primary objective was to compile a comprehensive experimental database to improve the mechanistic understanding of tree/crop interactions and support the development and validation of process-based simulation models describing resource capture and tree and crop growth in semiarid agroforestry systems. *Grevillea robusta* (*grevillea*) trees were grown as monocultures or in mixtures with cowpea (*Vigna unguiculata*) or maize (*Zea mays*) over a 68-month period. Allometric approaches were used to determine seasonal and annual growth increments for leaf area and leaf, branch and trunk biomass in *grevillea*. Crop performance was examined during each growing season, while the spatial distribution of tree and crop roots was established during the latter stages of the experiment using coring and minirhizotron approaches. Detailed hydrological studies examined effects on the soil water balance and its components (precipitation, interception, runoff and soil moisture status); equivalent measurements of spatial and temporal variation in microclimatic conditions allowed the mechanistic basis for beneficial and detrimental effects on understorey crops and the influence of proximity to trees on crop performance

to be examined. Transpiration by grevillea and water movement through lateral and tap roots were measured using sap flow methodology, and light interception by the tree and crop canopies was routinely determined. This multidisciplinary study has provided a detailed understanding of the changing patterns of resource capture by trees and crops as agroforestry systems mature. The paper provides an overview of the underlying rationale, experimental design and core measurements, outlines key results and conclusions, and draws the attention of readers to further papers providing more detailed consideration of specific aspects of the study

Descriptors:agroforestry-systems. agrosilvicultural-systems. research-projects. microclimate. semiarid-zones. water-use. biomass-production. cowpeas. experimental-design. hydrology. interception. leaf-area. light-relations. maize. methodology. precipitation. runoff. sap-flow. simulation-models. soil-water. soil-water-balance. spatial-distribution. temporal-variation. seasonal-variation. transpiration. understory. water-balance. plant-water-relations. interactions. growth. increment. root-systems. crop-yield. spatial-variation  
Geographic Locator:Kenya

Organism Descriptors:Vigna-unguiculata. Grevillea-robusta. Zea-mays  
Supplemental Descriptors:Vigna. Papilionoideae. Fabaceae. Fabales. dicotyledons. angiosperms. Spermatophyta. plants. Grevillea. Proteaceae. Proteales. Zea. Poaceae. Cyperales. monocotyledons. East-Africa. Africa-South-of-Sahara. Africa. Developing-Countries. ACP-Countries. Commonwealth-of-Nations. Anglophone-Africa

Subject Codes:KK600. FF150. ZZ900. FF005. PP500. FF062. PP200. JJ300

Supplementary Info:68 ref

ISSN:0167-8809

Year:2000

Journal Title:Agriculture, Ecosystems & Environment

Copyright:Copyright CAB International

89. Title:Allometric estimation of above-ground biomass and leaf area in managed *Grevillea robusta* agroforestry systems

View Article: Agroforestry Systems. 2000. 49 (1). 1-15

CD Volume:309

Print Article: Pages: 1-15

Author(s):Lott J E Howard S B Black C R Ong C K

Author Affiliation:Correspondence address: Plant Science Division, School of Biological Sciences, University of Nottingham, Loughborough, LE12 5RD, UK

Language:English

Abstract:Non-destructive methods for determining the biomass and leaf area of individual trees throughout their growing cycle are an essential tool in agroforestry research, but must be capable of providing reliable estimates despite the influence that management strategies such as pruning may have on tree form. In the present study, which was carried out at the ICRAF Machakos Field Research Station in Kenya (as part of the CIRUS Complementarity In Resource Use on Sloping Land trial), allometric methods involving measurements of the diameter of all branches provided reliable estimates of canopy leaf area and biomass for grevillea trees (*Grevillea robusta*) grown as poles (annual pruning of 50% of the canopy by lopping the basal branches) in agroforestry systems (intercropped with maize, cowpeas or beans), but proved unsuitable for routine measurements because of their time-consuming nature. An alternative, less laborious method based on measurements of stem cross-sectional area immediately below the first branch of the canopy provided satisfactory allometric estimates of leaf area and canopy biomass. Stem biomass was determined from measurements of tree height and diameter at breast height using established methodology based on the assumption that stem volume may be calculated using a quadratic paraboloid model; biomass was determined as the product of stem volume and the specific gravity of the wood. The theoretical basis, development and validation of allometric methods for estimating tree growth are discussed and their wider applicability to other agroforestry systems is assessed



Descriptors:agroforestry-systems. biomass. leaf-area. canopy. measurement. methodology. pruning. specific-gravity. agrosilvicultural-systems. allometry. estimation. lopping. intercropping. maize. cowpeas. beans. stems. mathematical-models  
Geographic Locator:Kenya  
Organism Descriptors:Grevillea. Grevillea-robusta. Zea-mays. Vigna-unguiculata. Phaseolus-vulgaris  
Supplemental Descriptors:Proteaceae. Proteales. dicotyledons. angiosperms. Spermatophyta. plants. Grevillea. Zea. Poaceae. Cyperales. monocotyledons. Vigna. Papilionoideae. Fabaceae. Fabales. Phaseolus. East-Africa. Africa-South-of-Sahara. Africa. Developing-Countries. ACP-Countries. Commonwealth-of-Nations. Anglophone-Africa  
Subject Codes:KK600. FF150. FF005. ZZ900. ZZ100  
Supplementary Info:29 ref  
ISSN:0167-4366  
Year:2000  
Journal Title:Agroforestry Systems  
Copyright:Copyright CAB International

90. Title:Optimising the management of even-aged Shorea robusta stands in southern Nepal using individual tree growth models

View Article: Forest Ecology and Management. 2000. 126 (3). 417-429

CD Volume:336

Print Article: Pages: 417-429

Author(s):Rautiainen O Pukkala T Miina J

Author Affiliation:Pohjois-Savon metsälautakunta, P.O. Box 1019, 70101, Kuopio, Finland

Language:English

Abstract:Optimal treatment schedules are presented for even-aged Shorea robusta stands using varying management objectives. The objective variables used were total wood production (WP), commercial timber production (CTP), sawlog production (SLP), forest rent (FR) and soil expectation value (SEV). A simulation-optimization system was developed based on a spatial yield model. The non-linear method of Hooke and Jeeves was used to solve the optimization problems. The treatment schedules were optimized with zero, 1 and 2 thinnings per rotation. Results on 2 dense 5-yr-old stands are presented. Irrespective of the management objective, the first thinning was conducted immediately in both the stands. When wood production was maximized the rotation length was short: 6 and 24 yr. Treatment schedules for maximal CTP and SEV were relatively similar: the rotation lengths for maximal CTP were 23 and 41 yr and for SEV 19 and 51 yr for the 2 stands, respectively. Maximizing SLP or FR required heavy thinnings and a long rotation: 57 and 85 yr for SLP and 52 and 87 yr for FR. The mean annual increments of the optimal treatment schedules were 8.5-25.1 m<sup>3</sup> ha<sup>-1</sup> for total wood production, 6.5-12.1 m<sup>3</sup> ha<sup>-1</sup> for commercial timber production, and 4.8-7.6 m<sup>3</sup> ha<sup>-1</sup> for sawlogs

Descriptors:growth-models. tropical-forests. optimization. thinning. silviculture. forest-management. planning. simulation-models. increment. forest-economics. wood. production. merchantable-volume. sawnwood. production-possibilities. yield-forecasting. rotations. yield-regulation

Geographic Locator:Nepal

Organism Descriptors:Shorea. Shorea-robusta

Supplemental Descriptors:Dipterocarpaceae. Theales. dicotyledons. angiosperms.

Spermatophyta. plants. Shorea. South-Asia. Asia. Least-Developed-Countries.

Developing-Countries

Subject Codes:KK110. EE112

Supplementary Info:37 ref

ISSN:0378-1127

Year:2000

Journal Title:Forest Ecology and Management

Copyright:Copyright CAB International

91. Title:Development of ochratoxin A during Robusta (*Coffea canephora*) coffee cherry drying

View Article: Journal of Agricultural and Food Chemistry. 48 (4). April, 2000. 1358-1362

CD Volume:301

Print Article: Pages: 1358-1362

Author(s):Bucheli Peter Kanchanomai Chaorai Meyer Inge Pittet Alain

Author Affiliation:Nestle Research Center, 101 Av. Gustave Eiffel, F-37390, Notre Dame d'Oe

Language:English

Language of Summary:English (EN)

Abstract:The occurrence and formation of ochratoxin A (OTA) in Robusta coffee was studied for three consecutive seasons under tropical conditions in Thailand. Sun drying of coffee cherries consistently led to OTA formation in the pulp and parchment (husks) of the cherries. In replicated trials, dried coffee beans (green coffee) were shown to contain on average OTA concentrations that were approx 1% of those found in husks. OTA contamination of green coffee depended on cherry maturity, with green cherries being the least, and overripe cherries the most susceptible. Defects, and in particular the inclusion of husks, are the most important source of OTA contamination. OTA contamination occurred independently of whether cherries were placed on concrete, on bamboo tables, or on the ground. The study suggests that better raw material quality, an appropriate drying and dehulling procedure combined with a reduction of green coffee defects can effectively contribute to the reduction of OTA in green coffee

Descriptors:Foods; Toxicology. ochratoxin A: toxin

Organism Descriptors:*Coffea canephora* [robusta coffee] (Rubiaceae); mold (Fungi): contaminant

Supplemental Descriptors:Fungi: Plantae; Rubiaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Fungi; Microorganisms; Nonvascular Plants; Plants; Spermatophytes; Vascular Plants

Subject Codes:Foods; Toxicology

ISSN:0021-8561

Year:2000

Journal Title:Journal of Agricultural and Food Chemistry

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92. Title:Phenolic constituents from *Grevillea robusta*

View Article: Phytochemistry (Oxford). 53 (1). Jan., 2000. 149-154

CD Volume:330

Print Article: Pages: 149-154

Author(s):Ahmed Amany S Nakamura Norio Meselhy Meselhy R Makhboul Makhboul A El Emary Nasr Hattori Masao

Author Affiliation:Institute of Natural Medicine, Toyama Medical and Pharmaceutical University, 2630 Sugitani, Toyama, 930-0194

Language:English

Language of Summary:English (EN)

Abstract:Seven phenolic compounds were isolated from a MeOH extract of the leaves of *Grevillea robusta*. Their structures were determined by various spectral methods including 2D NMR spectroscopy

Descriptors:Biochemistry and Molecular Biophysics. 5-alkylresorcinols: phenolic constituent; grevirobstols: phenolic constituent; macrocyclic phenols: phenolic constituent; robustasides: phenolic constituent

Organism Descriptors:*Grevillea robusta* (Proteaceae)

Supplemental Descriptors:Proteaceae: Dicotyledones, Angiospermae, Spermatophyta, Plantae. Angiosperms; Dicots; Plants; Spermatophytes; Vascular Plants

Subject Codes:Biochemistry and Molecular Biophysics

ISSN:0031-9422

Year:2000

Journal Title:Phytochemistry

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93. Title:A comparison of the effects of auxin on cluster root initiation and development in *Grevillea robusta* Cunn. ex R. Br. (Proteaceae) and in the genus *Lupinus* (Leguminosae)

View Article: Plant and Soil. 2000. 219 (1/2). 221-229

CD Volume:309

Print Article: Pages: 221-229

Author(s):Skene K R James W M

Author Affiliation:Department of Biological Sciences, University of Dundee, Dundee, Scotland DD1 4HN, UK

Language:English

Abstract:The effect of NAA (naphthaleneacetic acid) on the development of cluster roots in members of the Proteaceae and Leguminosae was investigated. The exogenous addition of NAA led to initiation of cluster roots in phosphate conditions normally inhibitory for their development, but initiation took place within the limits of the cluster pattern -P conditions. There was no change in spacing within the cluster root nor between cluster roots in *Grevillea robusta* or in rootlet length or cluster root length. In *Lupinus albus*, change in rootlet length and cluster root length was noted at 10-10 and 10-12 M NAA. In *L. albus*, the length of time that roots were exposed to NAA does not appear to be important, with similar levels of cluster root initiation after 48 h and 7 days. Cluster root production in *G. robusta* differed from that in *L. albus* in terms of the concentration of NAA needed to induce initiation, and in the effects of extremely low levels of NAA on rootlet numbers and lengths. *L. arboreus* does not produce cluster roots under -P conditions. Furthermore, neither *L. arboreus*, *L. angustifolius*, *L. luteus* nor *L. mutabilis* were induced to produce cluster roots under -P conditions, nor under conditions in the presence of exogenous NAA. Thus, exogenous NAA only leads to the induction of cluster roots, at levels of P normally inhibitive of their development, in species of *Lupinus* that produce them under -P conditions. Auxin-induced cluster roots develop within the same constraints as those developing under -P conditions. NAA does not induce cluster roots in species of *Lupinus* that do not produce them under -P conditions

Descriptors:initiation. induction. NAA. spacing. plant-growth-regulators. auxins. roots. lupins

Organism Descriptors:*Grevillea*. *Grevillea-robusta*. *Lupinus*. Proteaceae. *Lupinus-albus*. *Lupinus-angustifolius*. *Lupinus-arboreus*. *Lupinus-luteus*. *Lupinus-mutabilis*

Supplemental Descriptors:Proteaceae. Proteales. dicotyledons. angiosperms. Spermatophyta. plants. *Grevillea*. Papilionoideae. Fabaceae. Fabales. *Lupinus*

Subject Codes:FF060. FF030. FF100. KK100. FF061. JJ700. KK600

Supplementary Info:52 ref

ISSN:0032-079X

Year:2000

Journal Title:Plant and Soil

Copyright:Copyright CAB International

94. Title:Estimation of tree root lengths using fractal branching rules: a comparison with soil coring for *Grevillea robusta*

View Article: Plant and Soil. 2001. 229 (2). 295-304

CD Volume:372

Print Article: Pages: 295-304

Author(s):Smith D M

Author Affiliation:Centre for Ecology & Hydrology, Crowmarsh Gifford, Wallingford, Oxfordshire OX10 8BB, UK

Language:English

Abstract:Previous theoretical research has suggested that lengths of tree roots can be estimated on the basis of their branching characteristics, if branching has a fractal pattern that is independent of root diameter. This theory and its underlying assumptions were tested for *Grevillea robusta* trees at a site in Kenya by comparing estimates of root length from conventional soil coring and the output of a fractal branching algorithm. The trees were in a 4-year-old

stand established on a 3 x 4 m planting grid. Root lengths ( $L_r$ ) in four units of the planting grid were estimated by soil coring. Branching characteristics determined by examination of 32 excavated roots from 16 trees were: The number of branches at each branching point; the length of links between branching points ( $L_l$ ); the diameter of root tips; and parameters which describe the change in diameter at each branching point. Each was found to be independent of root size. These data were used to parameterize a branching algorithm, which was then used to estimate numbers of root links in the four grid units ( $n_l$ ) from root diameters at the bases of the four trees at the corners of each unit. Root lengths, from  $L_r = n_l L_l$ , severely underestimated  $L_r$ . This discrepancy probably resulted from inaccuracy in the parameterization of the branching algorithm, as output from the algorithm was very sensitive to small changes in parameter values. Use of fractal branching rules alone to estimate roots length does not appear possible unless the algorithm is calibrated to adjust for errors in parameter estimation. Calibration can be achieved by calculation of an effective link length,  $L_{effl}$ , from  $L_r/n_l$ , where  $L_r$  is measured by a reference method such as soil coring

Descriptors:algorithms. core-sampling. estimation. forest-plantations. fractals. length. mathematical-models. roots. soil

Geographic Locator:Kenya

Organism Descriptors:Grevillea-robusta

Supplemental Descriptors:Grevillea. Proteaceae. Proteales. dicotyledons. angiosperms. Spermatophyta. plants. East-Africa. Africa-South-of-Sahara. Africa. Developing-Countries. ACP-Countries. Commonwealth-of-Nations. Anglophone-Africa

Subject Codes:FF030. KK100. ZZ100

Supplementary Info:14 ref

ISSN:0032-079X

Year:2001

Journal Title:Plant and Soil

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