



# Agilent Technologies

## **Agilent J&W CP-Sil 8 CB**

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## Clinical research

### [Determination of amantadine in biological fluids using simultaneous derivatization and dispersive liquid–liquid microextraction followed by gas chromatography-flame ionization detection](#)

*Journal of Chromatography B*, **940**, 142-149  
(2013)  
Mir Ali Farajzadeh, Nina Nouri, Ali Akbar  
Alizadeh Nabil

**Tags**  
CP-Sil 8 CB, clinical research

#### **Abstract**

Chromatographic analysis of amantadine was achieved using an Agilent J&W CP-Sil 8 CB column. Published by Elsevier B. V.

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### [Spatial Reorganization of \*Saccharomyces cerevisiae\* Enolase To Alter Carbon Metabolism under Hypoxia](#)

*Eukaryotic Cell*, **12**, 1106-1119 (2013)  
Natsuko Miura *et al.*

**Tags**  
CP-Sil 8 CB, clinical research

#### **Abstract**

Derivatized metabolites in a study of yeast hypoxia were analyzed by GC/MS with an Agilent J&W CP-Sil 8 CB column. Published by the American Society for Microbiology.

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### [Metabolic Profiling of Oxidized Lipid-Derived Volatiles in Blood by Gas Chromatography/Mass Spectrometry with In-Tube Extraction](#)

*Mass Spectrometry (Tokyo)*, **10** (2013)  
Shoji Kakuta *et al.*

**Tags**  
CP-Sil 8 CB, clinical research

#### **Abstract**

The authors applied a GC/MS method using an Agilent J&W GC column to mouse plasma and identified 12 volatiles, including 1-octen-3-ol, which is correlated to disease states. Published by the Mass Spectrometry Society of Japan.

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[Detection of Orally Administered Inositol Stereoisomers in Mouse Blood Plasma and Their Effects on Translocation of Glucose Transporter 4 in Skeletal Muscle Cells](#)

*Journal of Agricultural and Food Chemistry*, **61**,  
4850–4854 (2013)  
Yoko Yamashita *et al.*

**Tags**  
CP-Sil 8 CB, 7890A GC, 7683B Autosampler,  
clinical research

**Abstract**

Simple pharmacological studies on inositol stereoisomers are presented in this study. Male ICR mice were orally administered 1 g/kg BW of three inositol stereoisomers, *myo*-inositol (MI), *d-chiro*-inositol (DCI), and *scyllo*-inositol (SI), and blood plasma samples and skeletal muscle fractions were prepared after an hour. The plasma samples were subjected to gas chromatography–coupled time-of-flight mass spectrometry (GC-TOF-MS) analysis. None of the three stereoisomers was seen in untreated samples, but substantial amounts ranging from 2.5 to 6.5 mM were detected only after administration, indicating that orally administered inositol stereoisomers were readily absorbed and their levels elevated in the bloodstream. In addition, plasma of SI-administered animals contained substantial MI, suggesting a possible metabolic conversion of SI to MI. In the skeletal muscle fractions, glucose transporter type 4 (GLUT4) content in the plasma membrane increased, indicating that inositol stereoisomers stimulated GLUT4 translocation. Reprinted with permission from the *Journal of Agricultural and Food Chemistry*. Copyright 2013 American Chemical Society.

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[A novel serum metabolomics-based diagnostic approach to pancreatic cancer](#)

*Cancer Epidemiology, Biomarkers and Prevention*, **22**, 571-579 (2013)  
Takashi Kobayashi *et al.*

**Tags**  
CP-Sil 8 CB, clinical research

**Abstract**

In an assessment of tumor markers for pancreatic cancer, serum metabolites were analyzed by GC/MS with an Agilent J&W CP-Sil 8 CB column. Published by the American Association for Cancer Research.

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[Metabolic profiling of human follicular fluid identifies potential biomarkers of oocyte developmental competence](#)

*Reproduction*, **146**, 389–395 (2013)  
A. O'Gorman *et al.*

**Tags**  
CP-Sil 8 CB, 7890A GC, 5975C MS, ChemStation,  
clinical research

**Abstract**

The use of metabolomic based techniques to aid oocyte and embryo selection has gained attention in recent years. Previous work from our laboratory has demonstrated that the <sup>1</sup>H NMR-based metabolic profile of follicular fluid correlates with oocyte developmental potential. Patients undergoing IVF at the Merrion Fertility Clinic had follicular fluid collected at the time of oocyte retrieval. The fatty acid composition of follicular fluid from follicles where oocytes fertilised and developed into multi-cell embryos ( $n=15$ ) and from oocytes that fertilised normally but failed to cleave ( $n=9$ ) (cleaved vs non-cleaved) was compared. Statistical analysis was performed on the data using univariate and multivariate techniques. Analysis of the fatty acid composition revealed that there were nine fatty acids significantly different between follicular fluid from the cleaved and the non-cleaved sample groups. Of particular interest were the higher concentration of total saturated ( $P=0.03$ ) and the lower concentration of total polyunsaturated fatty acids in the non-cleaved sample group ( $P=0.001$ ). Random forest classification models were used to predict successful cleavage in follicular fluid samples producing models with errors rates of <10%. Receiver operating characteristic analysis demonstrated that the model had good predictability with an area under the curve of 0.96. The panel of fatty acid biomarkers identified in this study indicates that the fatty acid composition of follicular fluid may be more predictive in comparison to other previously identified biomarkers. Following validation in a larger cohort, these biomarkers may have the potential to be used in fertility clinics to aid the selection of oocytes in the future. Published by the Society for Reproduction and Fertility.

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[Serum and Tissue Metabolomics of Head and Neck Cancer](#)

*Cancer Genomics and Proteomics*, **10**, 233-238  
(2013)  
Koichiro Yonezawa *et al.*

**Tags**  
CP-Sil 8 CB, clinical research

**Abstract**

The metabolomic analysis of serum and tissue samples obtained from patients with head and neck cancer was performed using GC/MS and an Agilent J&W CP-Sil 8 CB column. Published by the International Institute of Anticancer Research.

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### [Local administration of growth hormone stimulates](#)

*Journal of Applied Physiology*, **113**, 1432-1438  
(2012)  
Poul Vestergaard *et al.*

**Tags**  
CP-Sil 8 CB, CP-Sil 19 CB, clinical research

#### **Abstract**

Plasma for determination of phenylalanine enrichment was prepared and analyzed as its t-butyltrimethylsilyl derivative by GC/MS and separated by an Agilent CP-Sil 8 CB GC column. Amino acids were derivatized as their N-acetyl-n-propyl esters and the <sup>13</sup>C abundance under the phenylalanine peak was determined by GC/combustion isotope ratio MS with an Agilent J&W CP-Sil 19 CB column. Published by the American Physiological Society.

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## **Energy and chemicals**

### [Capillary GC column performance test for basic analytes](#)

*Journal of Microcolumn Separations*, **10**, 661–  
669 (1998)  
R. J. M. N. Dresen, H. J. W. Henderickx, Sj. van  
der Wal

**Tags**  
CAM, CP-Sil 8 CB for Amines, energy and  
chemicals

#### **Abstract**

An investigation of GC columns for basic analytes found that Agilent J&W CP-Sil 8 CB for Amines and CAM columns were best suited for analysis of amines at low concentration levels with respect to irreversible adsorption. Published by John Wiley and Sons.

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### [Copper \(II\) aza-bis \(oxazoline\) complex immobilized onto ITQ-2 and MCM-22 based materials as heterogeneous catalysts for the cyclopropanation of styrene](#)

*Microporous and Mesoporous Materials*, **179**,  
231-241 (2013)  
Ana R. Silva *et al.*

**Tags**  
CP-Sil 8 CB, CP-Chirasil-Dex CB, energy and  
chemicals, biofuels and alternative energy

#### **Abstract**

Reaction mixture was analyzed by GC-FID on a gas chromatograph equipped with a fused silica Agilent J&W CP-Sil 8 CB column. Enantiomeric excesses of the cyclopropanes were determined in the same chromatograph but using an Agilent J&W CP-Chirasil-Dex CB column. Published by Elsevier B. V.

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[Simultaneous derivatization and air-assisted liquid–liquid microextraction of some aliphatic amines in different aqueous samples followed by gas chromatography-flame ionization detection](#)

*Analytica Chimica Acta*, **775**, 50-57 (2013)  
Mir Ali Farajzadeh, Nina Nouri

**Tags**  
CP-Sil 8 CB, energy and chemicals

**Abstract**

Separation and determination of selected aliphatic amines was accomplished using an Agilent J&W CP-Sil 8 CB GC column. Published by Elsevier.

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[Dynamic capillary diffusion system for monoterpene and sesquiterpene calibration: quantitative measurement and determination of physical properties](#)

*International Journal of Environmental Analytical Chemistry*, **93**, 637-649 (2013)  
Jiri Kosina *et al.*

**Tags**  
CP-Sil 8 CB, VF-1ms, energy and chemicals

**Abstract**

This article describes a method for preparation of low concentration gas standard mixtures of biogenic volatile organic compounds (BVOCs) emitted primarily by plants. A set of 10 plant volatiles including  $\alpha$ -pinene,  $\beta$ -pinene, 3-carene, linalool, methyl salicylate,  $\alpha$ -cedrene,  $\beta$ -caryophyllene,  $\beta$ -farnesene, aromadendrene and  $\alpha$ -humulene was used in the study. Gas standard mixture of these compounds was generated using a capillary diffusion system (CDS). Diffusion coefficient ( $D$ ) and saturation vapour pressure ( $p_s$ ) data of these compounds were calculated from experimentally determined gas chromatographic retention indices ( $RI$ ) and empirical relationships between  $D$  and  $p_s$  versus  $RI$ . A comparison of the calculated and measured concentrations of investigated compounds has proved that designed CDS can be successfully used for the proper quantification of BVOCs. © 2013 Taylor and Francis.

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[Heterogeneous catalytic epoxidation of olefin over a hydrothermally synthesized 3D phosphate bridged copper \(II\) framework](#)

*Journal of Coordination Chemistry*, **66**, 2444-2454 (2013)  
D. Saha *et al.*

**Tags**  
CP-Sil 8 CB, energy and chemicals

**Abstract**

A 3D copper phosphate,  $[\text{Cu}_2(\text{PO}_4)(\text{OH})]_n$  (**1**), has been synthesized hydrothermally and characterized by single-crystal X-ray diffraction analysis. In  $[\text{Cu}_2(\text{PO}_4)(\text{OH})]_n$ , there are two types of copper centers having distorted trigonal bipyramidal geometry and distorted octahedral geometry that are connected by the  $\mu_2$ -bridging of each phosphate oxygen ultimately forming a  $\eta^8\text{-PO}_4$  bridged 3D network. The compound exhibited excellent catalytic performance in olefin epoxidation. Epoxidation of styrene and substituted styrenes, as well as bulky olefins like cycloalkenes and long-chain alkenes, is efficiently catalyzed by  $[\text{Cu}_2(\text{PO}_4)(\text{OH})]_n$  using *tert*-butylhydroperoxide in acetonitrile. The results obtained in the heterogeneous catalytic reactions show that the olefins are converted to the respective epoxides in good yield with high selectivity.  $[\text{Cu}_2(\text{PO}_4)(\text{OH})]_n$  was catalytically more active and selective in comparison to simple copper(II) phosphate salt in heterogeneous medium. The catalyst can be recycled and reused several times without significant loss of activity. © 2013 Taylor and Francis.

[Hydrogen Production from Methanol Steam Reforming over Cu/ZnO/Al<sub>2</sub>O<sub>3</sub>/CeO<sub>2</sub>/ZrO<sub>2</sub> Nanocatalyst in an Adiabatic Fixed-Bed Reactor](#)

*Iranica Journal of Energy & Environment*, **3**, 307-313 (2012)  
Hassan Sharifi Pajaie, Majid Taghizadeh, Ali Eliassi

**Tags**  
CP-Sil 8 CB, energy and chemicals

**Abstract**

Hydrogen production from steam reforming of methanol was performed in an adiabatic fixed bed heterogeneous reactor by using Cu/ZnO/Al<sub>2</sub>O<sub>3</sub>/CeO<sub>2</sub>/ZrO<sub>2</sub> nanocatalyst. The catalyst was prepared by co-precipitation method and characterized by TGA, XRD, SEM and BET. By changing the mean average temperature of the catalyst bed (or reactor operation temperature) from 230 to 270°C, variations in methanol conversion were monitored. The results showed that the conversion of methanol was strongly dependent on the reaction temperature. In addition, the effects of weight hourly space velocity (WHSV) on methanol conversion were investigated. According to the results, the maximum conversion was obtained at 270°C with WHSV of 15 h<sup>-1</sup>.

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[Kinetics of Degradation of perchloroethylene under Ultrasonic Irradiation and Photooxidation in Aqueous Solution](#)

*Environmental Protection Engineering*, **39**, 29-38

(2013)

Mahdi Kargar *et al.*

**Tags**

CP-Sil 8 CB, energy and chemicals

**Abstract**

Perchloroethylene (PCE) is mainly used as a solvent and degreaser. In this work, PES was analyzed by head space gas chromatography with FID detection, using an Agilent J&W CP-Sil 8 CB column.

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## Environmental

[Glutaraldehyde in hospital wastewater](#)

*Archives of Environmental Contamination*, **42**,

137-144 (2002)

B. Jolibois, M. Guerbet, S. Vassal

**Tags**

Bond Elut PPL, CP-Sil 8 CB, environmental, water analysis

**Abstract**

The authors report that a method using Agilent BE-PPL basic SPE was better for extracting polar glutaraldehyde in hospital waste water. They then used an Agilent J&W CP-Sil 8 CB GC column for analysis. Published by Springer B. V.

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[Metabolomics-based component profiling of \*Halomonas\* sp. KM-1 during different growth phases in poly \(3-hydroxybutyrate\) production](#)

*Bioresource Technology*, **140**, 73-79 (2013)

You-Xun Jin, Lian-Hua Shi, Yoshikazu Kawata

**Tags**

CP-Sil 8 CB, environmental, emerging contaminants

**Abstract**

The relationship between the production of poly(3-hydroxybutyrate) (PHB) and metabolic changes during different growth phases was analyzed using GC/MS with an Agilent J&W CP-Sil 8 CB column. Published by Elsevier B. V.

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[Heterogeneous Fenton-like oxidation of monochlorobenzene using green synthesis of iron nanoparticles](#)

*Journal of Colloid and Interface Science*, **410**,  
67-73 (2013)  
Ye Kuang *et al.*

**Tags**  
CP-Sil 8 CB, HP-5ms, 6890GC, 5973 MSD,  
environmental, water analysis

**Abstract**

Analysis of oxidation of monochlorobenzene was accomplished using an Agilent GC/MSD system equipped with Agilent J&W CP-Sil 8 CB and HP-5ms GC columns. Published by Elsevier B. V.

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[Remediation of Pesticide-Polluted Water Using Ozonation as a Safe Method](#)

*Global Journal of Human Social Science*, **8**, 10-  
17 (2013)  
Ahmed Khamis Salama, Khaled A Osman

**Tags**  
CP-Sil 8 CB, environmental, air analysis

**Abstract**

Chlorpyrifos and cypermethrin were extracted by solid phase extraction and analyzed by GC/MS with an Agilent J&W CP-Sil 8 CB column. Published by Global Journals, Inc..

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[Biodegradation of high concentrations of benzene vapors in a two phase partition stirred tank bioreactor](#)

*Iranian Journal of Environmental Health Sciences & Engineering***10**, (2013)  
Ali Karimi *et al.*

**Tags**  
CP-Sil 8 CB, environmental, air analysis

**Abstract**

The present study examined the biodegradation rate of benzene vapors in a two phase stirred tank bioreactor by a bacterial consortium obtained from wastewater of an oil industry refinery house. Initially, the ability of the microbial consortium for degrading benzene was evaluated before running the bioreactor. The gaseous samples from inlet and outlet of bioreactor were directly injected into a gas chromatograph to determine benzene concentrations. Carbone oxide concentration at the inlet and outlet of bioreactor were also measured with a CO<sub>2</sub> meter to determine the mineralization rate of benzene. Influence of the second non-aqueous phase (silicon oil) has been emphasized, so at the first stage the removal efficiency (RE) and elimination capacity (EC) of benzene vapors were evaluated without any organic phase and in the second stage, 10% of silicon oil was added to bioreactor media as an organic phase. Addition of silicon oil increased the biodegradation performance up to an inlet loading of 5580 mg/m<sup>3</sup>, a condition at which, the elimination capacity and removal efficiency were 181 g/m<sup>3</sup>/h and 95%, respectively. The elimination rate of benzene increased by 38% in the presence of 10% of silicone oil. The finding of this study demonstrated that two phase partition bioreactors (TPPBs) are potentially effective tools for the treatment of gas streams contaminated with high concentrations of poorly water soluble organic contaminant, such as benzene. © The Authors.

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[Solid phase microextraction method for characterizing the organic fraction of an industrial brine stream](#)

*Desalination and Water Treatment*, **51**, 4630-4637 (2013)  
João F.B. Lima *et al.*

**Tags**  
CP-Sil 8 CB, 5890 GC, environmental, water analysis

**Abstract**

The manufacturing process of DOW Chemical Company in Portugal produces a brine stream containing organic contaminants. For recovering the sodium chloride by-product, it is necessary to fully characterize this brine stream. With this purpose, a direct immersion-solid phase microextraction-gas chromatograph (SPME-GC) analytical method was successfully optimized and implemented, being possible to quantify accurately, with reproducibility, the organic fraction at ppb levels. The effects of salt content, extraction time, temperature, and pH were investigated, and the SPME experimental conditions optimized. For the poly(dimethylsilyoxane-co-divinylbenzene) fiber utilized, the resulting parameters were: 25% (wt.) of NaCl, 30 min, 20°C, and pH 11. The fiber desorption was performed at 250°C for 15 min. The calibration curves of the representative organics of the brine (benzenamine, cyclohexanamine, 2-methylbenzenamine, *N*-cyclohexylcyclohexanamine, cyclohexyl alcohol, nitrobenzene, cyclohexanone, and 4-phenylcyclohexylamine) presented good correlation coefficients ( $0.991 \leq R^2 \leq 0.997$ ). The detection limits of the method were determined for each species for the optimized analytical conditions; the detection limits vary from 0.21 to 3.22 ppb, respectively for *N*-cyclohexylcyclohexanamine and benzenamine, the precision ranged from 4.4 to 8.7% RSD and the validation criteria was obeyed for all analytes. The industrial brine stream was then characterized during several days to register the concentration history of contaminants. Independently of the stream composition fluctuations, the SPME methodology developed and optimized in this work was able to assess accurately their concentrations at ppb levels. © 2013 Taylor and Francis.

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[Isolation of volatiles from oak wood \(\*Quercus alba\*\) by a thermomechanical process: Screening of some processing parameters](#)

*Separation Science and Technology*, **48**, 1851-1858 (2013)  
Hamid Mellouk *et al.*

**Tags**  
CP-Sil 8 CB, environmental, air analysis

**Abstract**

Experiments were performed to evaluate an extraction process developed in our laboratory called the instantaneous controlled pressure drop process ("Détente Instantanée Contrôlée" or (DIC)) for extracting volatile compounds from oak wood. This process involves subjecting oak chips for a short time (10 s to 12 min) under a steam pressure (1 to 6 bars or from 100 to 165°C). This first step is followed by a rapid decompression toward vacuum (up to 50 mbar). Some parameters were evaluated: steam pressure level, processing time, initial moisture content, chips thickness and velocity of the rapid decompression. A preliminary experimental design allowed optimizing the processing pressure and processing time: 6 bar and 5 minutes. Under these conditions, the optimal conditions were as follows: 20% for initial moisture content, 0.5 mm for the chips thickness. The number of decompressions towards vacuum was also investigated and it appeared that extraction yield can be enhanced by repeating the decompressions cycles for a same processing time. Moreover, GC-MS analysis indicated that DIC extract included the same molecules that obtained by steam distillation with almost the same percentages. © 2013 Taylor and Francis.

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[The Biodegradation of Methyl Tert-Butyl Ether \(MTBE\) by indigenous \*Bacillus cereus\* strain RJ1 isolated from soil](#)

*Petroleum Science and Technology*, **31**, 1835-1841 (2013)  
M. Abbaspour *et al.*

**Tags**  
CP-Sil 8 CB, environmental, soil, sludges, and sediments

**Abstract**

Methyl Tert-Butyl Ether (MTBE) is an oxygenated organic compound extensively substituted for lead in gasoline worldwide. MTBE can affect human and environment. In this research, biodegradation capability of MTBE by identified indigenous *Bacillus cereus* strain *RJ1* was studied. Obtained results showed that biological removal of MTBE with 200 mg/L samples in 28°C is 27.5% while in 37°C within 120 days reaches to 34%. In addition, biodegradation of *Bacillus cereus RJ1* in 500 mg/L and 1,000 mg/L is 28% and 23.9% in 28°C, respectively. Therefore, this bacterium could clean up MTBE from the environment. © 2013 Taylor and Francis.

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## [Polycyclic Aromatic Hydrocarbons in drinking water of Tehran, Iran](#)

*Journal of Environmental Health Sciences & Engineering*, **11** (2013)  
Hamid Karyab *et al.*

### **Tags**

CP-Sil 8 CB, environmental, water analysis

### **Abstract**

Distribution and seasonal variation of sixteen priority polycyclic aromatic hydrocarbons (PAHs) were investigated in the drinking water of Tehran, the capital of Iran. Detected single and total PAHs concentrations were in the range of 2.01-38.96 and 32.45-733.10 ng/L, respectively, which were quite high compared to the values recorded in other areas of the world. The average occurrence of PAHs with high molecular weights was 79.55%; for example, chrysene occurred in 60.6% of the samples, with a maximum concentration of 438.96 ng/L. In addition, mean carcinogen to non-carcinogen PAHs ratio was 63.84. Although the concentration of benzo[a]pyrene, as an indicator of water pollution to PAHs, was lower than the guideline value proposed by World Health Organization (WHO) as well as that of Iranian National Drinking Water Standards for all of the samples, the obtained results indicated that carcinogen PAHs present in the drinking water of Tehran can cause threats to human health. © The Authors.

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## [Dichloromethane emissions from automotive manufacturing industry in Iran: case study of the SAIPA automotive manufacturing company](#)

*Toxicological & Environmental Chemistry*, **95**,  
757-764 (2013)  
Mehrnoosh Abtahi *et al.*

### **Tags**

CP-Sil 8 CB, environmental, air analysis, soil, sludges, and sediments

### **Abstract**

The primary data about the role of automotive manufacturing industry in emitting dichloromethane (DCM) to the environment in Iran are provided by a case study of SAIPA Automotive Manufacturing Company in 2012. The average emission rate and emission factor of DCM in the stack exhaust air streams of the solvent-based automotive painting plant were 6.8 kg·d<sup>-1</sup> and 19.5 g per car, respectively. The spray booths had the highest portion (about 85%) of DCM emission in the stack exhaust air streams. The average concentration of DCM (± standard deviation) in the generated wastewater of the factory was 64 ± 12 µg·L<sup>-1</sup>, but in the effluent of the factory wastewater treatment plant, it was reduced to a nondetectable level. DCM was also observed in three groundwater wells out of five monitored water resources. To control DCM emission and prevent pollution, the replacement of solvent-based paints with water-based paints is highly recommended. © 2013 Taylor and Francis.

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## [Biodegradation of Petroleum Tar by \*Pseudomonas\* Spp. From Oil Field of Assam, India](#)

*Bioremediation Journal*, **17**, 107-112 (2013)  
Bhaben Tanti, Alak Kumar Buragohain

CP-Sil 8 CB, environmental, soil, sludges, and  
sediments

### **Abstract**

Petroleum tar produced during the processing of crude oil is one of the earth's major pollutants. The potential of certain soil bacteria in the biodegradation of petroleum tar was assessed to develop an active indigenous bacterial consortium for bioremediation of petroleum tar-polluted sites of Assam, India. In vitro enrichment cultures of five *Pseudomonas* spp. were found to metabolize petroleum tar. The Fourier transform infrared (FTIR) analyses of the enrichment cultures revealed the presence of the functional groups, viz., -OH, -CHO, C=O, and -COOH, which provided evidence for the biodegradation of petroleum tar. Further, gas chromatography-flame ionization detection (GC-FID) analyses revealed complete degradation of low-molecular-weight hydrocarbons, and the subsequent appearance of some additional peaks reflected the formation of intermediate metabolites during the degradation of petroleum tar. A mixed culture with 0.1% Tween 80 as a surfactant exhibited almost complete degradation in contrast to the degradation by the mixed culture without Tween 80. This confirmed the effect of a surfactant for acceleration of the biodegradation process of petroleum tar.

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## [Characteristic Assessment of the Levels of Hydrocarbon Contamination of Soil after Massive Crude Oil Spill](#)

*Journal of Biological and Chemical Research*,  
**30**, 1-12 (2013)  
Imeh J. Okop, Fiokedu S. Okorie

CP-Sil 8 CB, environmental, soil, sludges, and  
sediments

### **Abstract**

57 contaminated soil samples from a crude oil spilled area were investigated about two months after a massive spillage from a petroleum Well-head in South-South Niger Delta. 400-600g of soil were collected at depths of 0-15 cm, 15-30 cm and 30-60 cm, prepared and analysed using gas chromatography equipped with a flame ionisation detector (GCFID). Penetration and migration of C5-C9, C10-C26 and C26 and above hydrocarbons through the soil layers were assessed by Principal Component Analysis (PCA) with cluster analysis to determine the distribution, penetration and similarity of these compounds over the contaminated area. The results indicated that total petroleum hydrocarbon concentrations varied from 12 – 401±3 mg kg<sup>-1</sup> topsoil, 9 – 325±1 mg kg<sup>-1</sup> subsoil and 11 – 197±12 mg kg<sup>-1</sup> at the greatest depth measured. The results also showed elevated levels of total hydrocarbon contents when compared with the reference sites. The paper recommends careful monitoring and sustainable remediation of the site by competent professionals.

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## Food testing and agriculture

### [Residue levels of captan and trichlorfon in field-treated kaki fruits, individual versus composite samples, and after household processing](#)

*Food Additives and Contaminants*, **23**, 591-600  
(2006)  
M. L. Fernández-Cruz *et al.*

**Tags**  
CP-Sil 24 CB, CP-Sil 8 CB, HP-5ms, food testing  
and agriculture, pesticides

#### **Abstract**

The dissipation of residue levels of captan and trichlorfon in field-treated kaki crops was studied using Agilent J&W GC columns. Published by Taylor and Francis.

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### [Investigation of Levels and Fate of Pyridalyl in Fruit and Vegetable Samples by Fast Gas Chromatography–Mass Spectrometry](#)

*Food Analytical Methods*, (2012)  
Svetlana Hrouzková *et al.*

**Tags**  
CP-Sil 8 CB, 6890N GC, 5975 MSD, 7683  
Autosampler, food testing and agriculture,  
pesticides

#### **Abstract**

GC/MS with an Agilent J&W CP-Sil 8 CB column in an Agilent 6890N/5975 GC/MS is a good tool for pyridalyl analysis because derivatization is not required. Published by Elsevier B. V.

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### [Analysis of arsenic species in fish after derivatization by GC–MS](#)

*Talanta*, **101**, 524-529 (2012)  
Janine Richter, Susanne Lischka, Christian  
Piechotta

**Tags**  
CP-Sil 8 CB, food testing and agriculture,  
pesticides

#### **Abstract**

The authors describe the derivatization of organoarsenic compounds by different reagents such as thioglycolates or dithiols. Subsequent analysis by GC/MS as a molecular specific technique made use of an Agilent J&W CP-Sil 8 CB column. Published by Elsevier B. V.

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[Absolute configuration of anabasine from \*Messor\* and \*Aphaenogaster\* ants](#)

*Journal of Chemical Ecology*, **27**, 945-952 (2001)

S. Leclerq *et al.*

**Tags**

CP-Chirasil Val, CP-Sil 5 CB, food testing and agriculture, mycotoxins and biotoxins

**Abstract**

A method was developed to analyze alkaloid anabasines from ants, using an Agilent J&W CP-Sil 5 CB column. Published by Springer B. V.

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[Organochlorine compounds in mussels cultured in the Ria of Vigo: Accumulation and origin](#)

*Chemosphere*, **90**, 7-19 (2013)

Pilar Suárez *et al.*

**Tags**

CP-Sil 8 CB, CP-Sil 19 CB, food testing and agriculture, pesticides

**Abstract**

Extracts were separated into two fractions and eluted with different solvents using either Agilent J&W CP-Sil 8 CB or CP-Sil 19 CB GC columns. Published by Elsevier B. V.

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[Analysis of naturally occurring phenolic compounds in aromatic plants by RP-HPLC coupled to Diode Array Detector \(DAD\) and GC-MS after silylation](#)

*Foods*, **2**, 90-99 (2013)

Charalampos Proestos, Michael Komaitis

**Tags**

CP-Sil 8 CB, food testing and agriculture

**Abstract**

The following aromatic plants of Greek origin, *Origanum dictamnus* (dictamnus), *Eucalyptus globulus* (eucalyptus), *Origanum vulgare* L. (oregano), *Mellisa officinalis* L. (balm mint) and *Sideritis cretica* (mountain tea), were examined for the content of phenolic substances. Reversed phase HPLC coupled to diode array detector (DAD) was used for the analysis of the plant extracts. The gas chromatography-mass spectrometry method (GC-MS) was also used for identification of phenolic compounds after silylation. The most abundant phenolic acids were: gallic acid (1.5–2.6 mg/100 g dry sample), ferulic acid (0.34–6.9 mg/100 g dry sample) and caffeic acid (1.0–13.8 mg/100 g dry sample). (+)-Catechin and (–)-epicatechin were the main flavonoids identified in oregano and mountain tea. Quercetin was detected only in eucalyptus and mountain tea. © The Authors.

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[Volatiles and water-and fat-soluble precursors of Saanen goat and cross Suffolk lamb flavour](#)

*Molecules*, **18**, 2150-2165 (2013)

Marta Madruga *et al.*

**Tags**

CP-Sil 8 CB, DB-5, CP-Sil 88, food testing and agriculture

**Abstract**

This paper evaluates the concentrations of water- and fat-soluble precursors of meat flavour, with the aim of characterising the effect of species on the volatile profile of grilled goat and lamb meat. Compared to goat, lamb meat had higher levels of saturated fatty acids—SFA, monounsaturated fatty acids—MUFA and polyunsaturated fatty acids—PUFA and similar levels of sugars and free amino acids, except for lysine and glycine, which were higher in goat. Major differences were detected in lipid-derived volatiles; only pyrazine, thiazole, and some Strecker aldehydes were at different concentrations in these species. Volatile compounds derived from the oxidation of linoleic acid were at higher levels in meat from lamb due to the higher concentration of the latter, while compounds formed from  $\alpha$ -linolenic acid were at higher levels in goat. It can be concluded that lamb meat has a stronger flavour profile compared to goat meat because it has the highest concentrations of lipid-derived volatile compounds, primarily straight saturated alkanals, pyrazines and thiazole. © The Authors.

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[Antimicrobial Activity of Natural Respitol-B and its Main Components against Poultry Microorganisms](#)

*Pakistan Journal of Biological Sciences*, **16**,  
1065-1068 (2013)  
Mohaddese Mahboubi, Nastaran Kazempour,  
Mahdi Valian

**Tags**  
CP-Sil 8 CB, food testing and agriculture,  
veterinary drugs

**Abstract**

Poultres are infected to different kinds of microbial infections during their growth. For prevent of these diseases, many farmers use the synthetic antimicrobial agents. Whereas, the poultries participate in food cycle of human, the residues of these agents enter in human and cause many undesired side effects. In this study, the antimicrobial activity of Respitol-B and its main components (eucalyptus oil and menthol) was evaluated on different kinds of microorganisms including gram positive, gram negative bacteria, yeast and fungi in vitro conditions by disc diffusion and micro broth dilution assays. The gram positive bacteria, yeast and fungi is more sensitive than Gram negative ones to Respitol-B. *Pseudomonas aeruginosa*, *Escherichia coli* and *Salmonella typhimurium* is less sensitive to Respitol-B. Evaluation of menthol and eucalyptus oil for their antimicrobial activities exhibited that the antimicrobial activity of menthol is higher than that of eucalyptus oil. Eucalyptus oil had the best effect on *Vibrio cholerae*, *Staphylococcus aureus*, *Aspergillus flavus* but had no effect on others. The antimicrobial activity of menthol is observable and its presence in Respitol-B enhances the antimicrobial activity of Respitol-B. Respitol-B as a 100% herbal drug has antimicrobial effect and can be used as alternative therapy for preventing and controlling of infections. © The Authors.

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[Determining PCBs in Fish and Sediment Samples Related to Intercomparison Studies](#)

*Polish Journal of Environmental Studies*, **22**,  
1341-1347 (2013)  
Anna Filipkowska

**Tags**  
CP-Sil 8 CB, HP-5, food testing and agriculture,  
persistent organic pollutants

**Abstract**

After extraction from fish, PCBs were analyzed on an Agilent J&W CP-Sil 8 CB column with confirmation on an Agilent J&W HP-5 column.

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## Genomics

[Metabolite profiling approach reveals the interface of primary and secondary metabolism in colored cauliflowers \(\*Brassica oleracea\* L. ssp. \*botrytis\*\)](#)

*Journal of Agricultural and Food Chemistry*, **61**,  
6999-7007 (2013)  
Soo-Yun Park *et al.*

**Tags**  
CP-Sil 8 CB, genomics, agricultural  
biotechnology

### Abstract

In the present study, carotenoids, anthocyanins, and phenolic acids of cauliflowers (*Brassica oleracea* L. ssp. *botrytis*) with various colored florets (white, yellow, green, and purple) were characterized to determine their phytochemical diversity. Additionally, 48 metabolites comprising amino acids, organic acids, sugars, and sugar alcohols were identified using gas chromatography–time-of-flight mass spectrometry (GC-TOFMS). Carotenoid content was considerably higher in green cauliflower; anthocyanins were detected only in purple cauliflower. Phenolic acids were higher in both green and purple cauliflower. Results of partial least-squares discriminant, Pearson correlation, and hierarchical clustering analyses showed that green cauliflower is distinct on the basis of the high levels of amino acids and clusters derived from common or closely related biochemical pathways. These results suggest that GC-TOFMS-based metabolite profiling, combined with chemometrics, is a useful tool for determining phenotypic variation and identifying metabolic networks connecting primary and secondary metabolism. Reprinted with permission from the *Journal of Agricultural and Food Chemistry*. Copyright 2013 American Chemical Society.

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[Fixation of CO<sub>2</sub> in \*Clostridium cellulovorans\* analyzed by <sup>13</sup>C-isotopomer-based target metabolomics](#)

*AMB Express*, **3** (2013)  
Masahiro Shinohara *et al.*

**Tags**  
CP-Sil 8 CB, genomics, agricultural  
biotechnology

**Abstract**

*Clostridium cellulovorans* has been one of promising microorganisms to use biomass efficiently; however the basic metabolic pathways have not been completely known. We carried out <sup>13</sup>C-isotopomer-based target metabolome analysis, or carbohydrate conversion process analysis, for more profound understanding of metabolic pathways of the bacterium. Our findings that pyruvate + oxaloacetate, fumarate, and malate inside and outside cells exhibited <sup>13</sup>C incorporation suggest that *C. cellulovorans* exactly fixed CO<sub>2</sub> and partly operated the TCA cycle in a reductive manner. Accompanied with CO<sub>2</sub> fixation, the microorganism was also found to produce and secrete lactate. Overall, our study demonstrates that a part of *C. cellulovorans* metabolic pathways related to glycolysis and the TCA cycle are involved in CO<sub>2</sub> fixation. Published by Springer.

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[Metabolic Differentiation of Diamondback Moth \(\*Plutella xylostella\* \(L.\)\) Resistance in Cabbage \(\*Brassica oleracea\* L. ssp. \*capitata\*\)](#)

*Journal of Agricultural and Food Chemistry*, **61**,  
11222–11230 (2013)  
Jae Kwang Kim *et al.*

**Tags**  
CP-Sil 8 CB, genomics, agricultural  
biotechnology

**Abstract**

The diamondback moth, *Plutella xylostella* (L.), is a major pest responsible for destroying cabbage and other *Brassica* vegetable crops. A diamondback moth-resistant cabbage line was studied by comparing its metabolite profiles with those of a susceptible cabbage. Fourier transform infrared spectroscopy analysis revealed that carbohydrates, aromatic compounds, and amides were the major factors that distinguished the resistant and susceptible genotypes. Gas chromatography–time-of-flight mass spectrometry profiled 46 metabolites, including 19 amino acids, 15 organic acids, 8 sugars, 3 sugar alcohols, and 1 amine in two genotypes and F1 hybrid cabbages. The levels of glycolic acid, quinic acid, inositol, fumaric acid, glyceric acid, trehalose, shikimic acid, and aspartic acid were found to be very significantly different between the resistant and susceptible genotypes with a *P* value of <0.0001. These results will provide a foundation for further studies on diamondback moth resistance in cabbage breeding and for the development of other herbivore-resistant crops. Reprinted with permission from the *Journal of Agricultural and Food Chemistry*. Copyright 2013 American Chemical Society.

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[4-Coumarate: CoA ligase partitions metabolites for eugenol biosynthesis](#)

*Plant Cell Physiology* (2013)  
Shubhra Rastogi *et al.*

**Tags**  
CP-Sil 8 CB, genomics, agricultural  
biotechnology

**Abstract**

Total eugenol in *Ocimum* sp. essential oil leaves was quantified by gas chromatography with an Agilent J&W CP-Sil 8 CB column. Published by Oxford University Press.

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[Metabolomics analysis and biosynthesis of rosmarinic acid in \*Agastache rugosa\* Kuntze treated with methyl jasmonate](#)

*PLoS ONE*, **8** (2013)  
Yeon Bok Kim *et al.*

**Tags**  
CP-Sil 8 CB, 7890A GC, genomics, agricultural biotechnology

**Abstract**

This study investigated the effect of methyl jasmonate (MeJA) on metabolic profiles and rosmarinic acid (RA) biosynthesis in cell cultures of *Agastache rugosa* Kuntze. Transcript levels of phenylpropanoid biosynthetic genes, i.e., *ArPAL*, *Ar4CL*, and *ArC4H*, maximally increased 4.5-fold, 3.4-fold, and 3.5-fold, respectively, compared with the untreated controls, and the culture contained relatively high amounts of RA after exposure of cells to 50  $\mu$ M MeJA. RA levels were 2.1-, 4.7-, and 3.9-fold higher after exposure to 10, 50, and 100  $\mu$ M MeJA, respectively, than those in untreated controls. In addition, the transcript levels of genes attained maximum levels at different time points after the initial exposure. The transcript levels of *ArC4H* and *Ar4CL* were transiently induced by MeJA, and reached a maximum of up to 8-fold at 3 hr and 6 hr, respectively. The relationships between primary metabolites and phenolic acids in cell cultures of *A. rugosa* treated with MeJA were analyzed by gas chromatography coupled with time-of-flight mass spectrometry. In total, 45 metabolites, including 41 primary metabolites and 4 phenolic acids, were identified from *A. rugosa*. Metabolite profiles were subjected to partial least square-discriminate analysis to evaluate the effects of MeJA. The results indicate that both phenolic acids and precursors for the phenylpropanoid biosynthetic pathway, such as aromatic amino acids and shikimate, were induced as a response to MeJA treatment. Therefore, MeJA appears to have an important impact on RA accumulation, and the increased RA accumulation in the treated cells might be due to activation of the phenylpropanoid genes *ArPAL*, *ArC4H*, and *Ar4CL*. ©Authors.

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[Unintended polar metabolite profiling of carotenoid-biofortified transgenic rice reveals substantial equivalence to its non-transgenic counterpart](#)

*Plant Biotechnology Reports*, **7**, 121–128 (2013)  
Jae Kwang Kim *et al.*

**Tags**  
CP-Sil 8 CB, 7890A GC, genomics

**Abstract**

The authors investigated substantial equivalence among carotenoid-biofortified GM rice and five conventional rice cultivars having common white (three) and red (two) grain color profiles by GC with an Agilent J&W CP-Sil 8 CB column fitted to an Agilent 7890A GC. Published by Springer.

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## Materials testing and research

[New analytical method for the determination of musks in personal care products by Quick, Easy, Cheap, Effective, Rugged, and Safe extraction followed by GC–MS](#)

*Journal of Separation Science*, **36**, 2176-2184  
(2013)  
Vera Homem *et al.*

**Tags**  
CP-Sil 8 CB, materials testing and research,  
consumer products

### Abstract

Musks in personal care products were analyzed using an Agilent J&W P-Sil 8 CB GC column.  
Published by Springer.

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[Electrochemical amination of anisole in 4–6 M solutions of H<sub>2</sub>SO<sub>4</sub> and acetonitrile](#)

*Russian Journal of Electrochemistry*, **49**, 91-95  
(2013)  
Yu. A. Lisitsynz, A. V. Sukhov

**Tags**  
CP-Sil 8 CB, materials testing and research

### Abstract

Quantitative analysis of ortho- and para- anisidines was performed by GC/FID equipped with an Agilent J&W CP-Sil 8 CB column. Published by Springer.

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## Small molecule pharmaceuticals

### [Pachydictyols B and C: New Diterpenes from \*Dictyota dichotoma\* Hudson](#)

*Marine Drugs*, **11**, 3109-3123 (2013)  
Ghada S. E. Abou-El-Wafa *et al.*

**Tags**  
CP-Sil 8 CB, small molecule pharmaceuticals,  
drug discovery

#### **Abstract**

Two new diterpenoids, pachydictyol B (1a/1b) and C (2), were isolated from the dichloromethane extract of the marine brown alga, *Dictyota dichotoma*, collected from the Red Sea coast of Egypt, along with the known metabolites, pachydictyol A (3a), dictyol E (4), *cis*-africanan-1 $\alpha$ -ol (5a), fucosterol (6), tetrahydrothiophen-1,1-dioxide and poly- $\beta$ -hydroxybutyric acid. GC-MS analysis of the nonpolar fractions also indicated the presence of  $\beta$ -bourbonene and nonanal, along with three hydrocarbons and five fatty acids or their simple derivatives, respectively. GC-MS analysis of the unsaponifiable algal petroleum ether extract revealed the presence of a further eight compounds, among them 2,2,6,7-tetramethyl-10-oxatricyclo[4.3.0.1(1,7)]decan-5-one (7), *N*-(4-bromo-*n*-butyl)-piperidin-2-one (8) and *tert*-hexadecanethiol. Structures 1–6 were assigned by 1D and 2D NMR, mass spectra (EI, CI, HREI and HRESI) and by comparison with data from related structures. The crude algal extract was potently active against the breast carcinoma tumor cell line, MCF7 (IC<sub>50</sub> = 0.6  $\mu$ g mL<sup>-1</sup>); pachydictyol B (1a) and dictyol E (4) showed weak antimicrobial properties, and the other compounds were inactive. Pachydictyols B (1a) and C (2) demonstrated a weak and unselective cytotoxicity against twelve human tumor cell lines with a mean IC<sub>50</sub> of >30.0  $\mu$ M. ©The Authors.

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### [Chemical characterization of essential oils from \*Drimys angustifolia\* Miers \(Winteraceae\) and antibacterial activity of their major compounds](#)

*Journal of the Brazilian Chemical Society*, **24**,  
164-170 (2013)  
Thalita G. Santos *et al.*

**Tags**  
CP-Sil 8 CB, small molecule pharmaceuticals,  
traditional medicines

#### **Abstract**

Essential oils from *Drimys angustifolia* were analyzed by GC/FID and GC/MS using an Agilent J&W CP-Sil 8 CB column. Published by the Brazilian Chemical Society

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### [Chemical Composition and Antibacterial Activity of Wax from \*Actiniopteris radiata\* \(Sw.\) Link](#)

*Journal of Essential Oil Bearing Plants*, **16**, 387-392 (2013)

Manjunath Manubolua *et al.*

#### **Tags**

CP-Sil 8 CB, 6890GC, 5973 MSD, 7863

Autosampler, small molecule pharmaceuticals, traditional medicines

#### **Abstract**

The wax obtained from whole fern of *Actiniopteris radiata* (Sw.) Link was analyzed by gas chromatography-mass spectrometry. 37 compounds, out of 38, were identified with the combination of fatty acids, alkanes, triterpenoids and sterols. 9,12,15-octadecatrien-1-ol (18.7 %), Hexa decanoic acid (10.8 %), Hepatacosane (8.3 %),  $\alpha$ -amyrin (7.0%),  $\beta$ -sitosterol (6.9 %) and n-Hexadecanoic acid (6.1 %) were the major contents in the wax. Agar well diffusion and micro dilution broth methods were applied to find antibacterial activity against both Gram-positive and Gram-negative bacteria. The wax has shown activity against all selected bacteria, indicating the broad-spectrum antibiotic activity. The maximum activity was observed against *S. aureus*. © 2013 Taylor and Francis.

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### [Chemical Composition of the Essential oil of \*Chromolaena odorata\* \(L.\) RM King & H. Rob. Roots from India](#)

*Journal of Chromatography*, (2013)

R .K. Joshi

#### **Tags**

CP-Sil 8 CB, small molecule pharmaceuticals, traditional medicines

#### **Abstract**

The hydrodistilled essential oil of the roots of *Chromolaena odorata* (L.) R. M. King & H. Rob. was analysed by gas chromatography equipped with flame ionization detector (GC-FID) and gas chromatography coupled with mass spectrometry (GC/MS). A total of twenty-nine compounds have been identified, accounting 97.6% of the total oil. The main constituents were himachalol (24.2%), 7-isopropyl-1,4-dimethyl-2-azulenol (17.6%), androencecalinol (14.1%), and 2-methoxy-6-(1-methoxy-2-propenyl) naphthalene (5.6%). The essential oil consists mainly of phenyl derivatives (41.6%), followed by oxygenated sesquiterpenes ((26.6%), long-chain hydrocarbons (18.9%), sesquiterpene hydrocarbons (6.8%), oxygenated monoterpenes (2.8%), and monoterpene hydrocarbons (0.9%). This study revealed that the roots of *C. odorata* produced different chemotypes other than leaves oil. This is the first report on the essential oil composition of the roots of *C. odorata*. © The Author.

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## [Chemical Composition of the Essential Oil of Camphor Basil \(\*Ocimum kilimandscharicum\* Guerke\)](#)

*Global Journal of Medicinal Plant Research*, **1**,:  
207-209 (2013)  
R .K. Joshi

**Tags**  
CP-Sil 8 CB, small molecule pharmaceuticals,  
traditional medicines

### **Abstract**

The essential oil obtained by hydro-distillation of the leaves of *Ocimum kilimandscharicum* Guerke, was analyzed by gas chromatography equipped with a flame ionization detector (GC-FID) and gas chromatography, coupled with mass spectrometry (GC/MS), using an Agilent J&W CP-Sil 8 CB column. Forty-one constituents were identified, which comprised 97.1% of the total constituents. The most abundant compound was camphor (45.9%), followed 1,8-cineol (14.6%) and limonene (8.1%). © The Author.

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## [Metabolomic analysis and phenylpropanoid biosynthesis in hairy root culture of tartary buckwheat cultivars](#)

*PLoS ONE*, **8** (2013)  
Aye Aye Thwe *et al.*

**Tags**  
CP-Sil 8 CB, 7890A GC, small molecule  
pharmaceuticals, traditional medicines

### **Abstract**

Buckwheat, *Fagopyrum tataricum* Gaertn., is an important medicinal plant, which contains several phenolic compounds, including one of the highest content of rutin, a phenolic compound with anti-inflammatory properties. An experiment was conducted to investigate the level of expression of various genes in the phenylpropanoid biosynthetic pathway to analyze *in vitro* production of anthocyanin and phenolic compounds from hairy root cultures derived from 2 cultivars of tartary buckwheat (Hokkai T8 and T10). A total of 47 metabolites were identified by gas chromatography–time-of-flight mass spectrometry (GC-TOFMS) and subjected to principal component analysis (PCA) in order to fully distinguish between Hokkai T8 and T10 hairy roots. The expression levels of phenylpropanoid biosynthetic pathway genes, through qRT-PCR, showed higher expression for almost all the genes in T10 than T8 hairy root except for *FtF3'H-2* and *FtFLS-2*. Rutin, quercetin, gallic acid, caffeic acid, ferulic acid, 4-hydroxybenzoic acid, and 2 anthocyanin compounds were identified in Hokkai T8 and T10 hairy roots. The concentration of rutin and anthocyanin in Hokkai T10 hairy roots of tartary buckwheat was several-fold higher compared with that obtained from Hokkai T8 hairy root. This study provides useful information on the molecular and physiological dynamic processes that are correlated with phenylpropanoid biosynthetic gene expression and phenolic compound content in *F. tataricum* species. © The Authors.

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