Journal of Chromatography & Separation Techniques

Hu, J Chromatogr Sep Tech 2017, 8:1
DOI: 10.4172/2157-7064.100e141

Editors Note OMICS International

# Editor's Note: Journal of Chromatography and Separation Techniques

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**Received date:** February 22, 2017; **Accepted date:** February 23, 2017; **Published date:** February 28, 2017



## Editor's Note

Identification of individual component from a natural mixture sample is having the utmost importance in the drug development industry. Generally, plant components or natural material on the earth use to present in a complex form and the individual components have been found to have specific beneficiary effect on specific disease. Such urgency to isolate the unit component or active ingredient influenced the invention of chromatography-a separation technique. Chromatography is widely used across the industries, be it chemical or biological. It has diverse applications, it is used to separate chiral compounds, identify and isolate impurities, identify individual components in a mixture etc. Therefore, advancement in chromatography and separation techniques is the need of the hour.

This issue presents some interesting findings. Lin et al. [1], developed a protocol for using microfluidics to study wound healing mechanisms. Fitri et al. [2], developed a convenient method for estimation of the organophosphate glyphosate in crude palm oil (CPO) and crude palm kernel oil (CPKO) using HPLC. Bongiovanni et al. [3], analyzed the volatiles present in cinnamon using GC-MS. They identified 72 compounds, majority of which were oxygenated compounds whereas 18% of them were non-oxygenated terpenes. Arnoldi et al. [4], identified azulene, 4-carene, trans-3(10) caren-2-ol, caryophyllene, caryophyllene oxide, gurjunene, ß-humulene, ledene, limonene, ß-myrcene, α-Pinene, and 4,7,7-trimethylbicyclo (4.1.0) heptan-3-ol as being the volatile components present in hashish. Ferro et al. [5], devised a methodology for detection of GHRPs using serum as a sample. It was observed that the detection windows for GHRP in the serum and urine samples were comparable [6]. Kuriakose et al. [7], developed a direct method for quantifying NDELA in ethanolamine by LC-MS.

The current issue of the Journal of Chromatography and Separation Techniques presents some interesting studies like microfluidics for studying cell migration, methods for the determination of glyphosate impurities in palm oil, identification of volatiles from the leaf and bark of Cinnamomum cassia, characterization of volatile components present in hashish, investigation of serum as a sample for identifying Growth hormone releasing peptides in doping analysis, a method for estimation of residual herbicide (atrazine) in agricultural produce, and a direct method for estimating N-nitrosodiethanolamine (NDELA) amounts in ethanolamine.

Microfluidic chips help establish *in vitro* models where the intracellular microenvironment can be accurately reconstructed. Nonetheless, studies where the cellular parameters in question are a function of the substrate composition, composition are prone to erroneous results, thereby limiting the applications in wound-healing and cell-migration. In this issue, Lin et al. [1], cells migration effects in four kinds of microfluidic chips with the same geometry investigated cell migration in 4 types of microchips having the same geometry. They are- (1) PDMS bonded on culture dish (PDMS-DISH), (2) PDMS bonded on glass slide (PDMS-GLASS), (3) PDMS bonded on PDMS (PDMS-PDMS), and (4) PMMA bonded on PMMA (PMMA-PMMA). The results revealed that cells migration varied on these chips. When the authors used trypsin/EDTA in addition to cell culture medium, most of cells exhibited a normal morphology and grew as a monolayer. The cell-migration rates were 20.30 μm/h (PDMS-DISH), 18.63 μm/h (PDMS-GLASS), 15.00 μm/h (PDMS-PDMS), and 10.75 μm/h (PMMA-PMMA), respectively. Thus, microfluidics can be used to study wound healing mechanisms.

Now-a-days, the remnants of pesticide in crops over the long-term are a grave concern. In this issue, Fitri et al. [2], developed an elegant method for the determination of glyphosate in crude palm oil (CPO) and crude palm kernel oil (CPKO) using high performance liquid chromatography. Glyphosate was fluorescently labled using 9-fluorenylmethylchloroformate (FMOC-Cl) and then separated using a reverse phase column (C18) having acetonitrile and potassium dihydrogen phosphate as the mobile phase. The average glyphosate recovery ranged between 80% and 100% at five fortification levels with less than 3% relative standard deviation (RSD). This method will facilitate quantification of glyphosate residues in palm oil and help in quality assurance of palm oil products.

The volatile compounds from the leaf and bark of the Cinnamomum cassia (Nees and Nees T) are used in various foods, beverages, cosmetics, and perfumes. In traditional medicine it is widely used to treat blood circulation disturbance and inflammatory diseases. In this issue, Bongiovanni et al. [3], analyzed the volatile compounds found in cinnamon using gas chromatography-mass spectrometry (GC-MS). They identified 72 compounds of which, they quantified 41. The majority of the volatiles were oxygenated compounds whereas 18% of them were non-oxygenated terpenes. The authors also assessed the odor quality of cassia essential oil by Gas Chromatography-Olfactometry (GC-O) through which they identified 26 components which contained aromatic compounds such as cinnamaldehyde, guaiacol, 2-phenylethanol, and 3-phenylpropanal.

Cannabis preparations are among the most frequently consumed illicit drugs. More than 90 phytocannabinoids identified in Cannabis and its volatiles constituents have been extensively studied. On the other hand, despite the fact that the volatile compounds from hashish could be very useful in characterizing different preparations, less attention was paid to them. Arnoldi et al. [4], employed solid phase microextraction coupled to GC/MS and headspace sampling for characterizing the volatile components of several Cannabis preparations (hashish). Through this analysis the authors identified azulene, 4-carene, trans-3(10) caren-2-ol, caryophyllene, caryophyllene oxide, gurjunene, ß-humulene, ledene, limonene, ß-myrcene, α-Pinene, and 4,7,7-trimethylbicyclo (4.1.0) heptan-3-ol as being the

volatile components in hashish preparations. Caryphyllene was identified as the most abundant volatile terpene whose quantity ranged from 800 to 3000 µg/g.

Growth hormone releasing peptides (GHRPs) have been in the limelight as they come under the aegis of performance enhancing and are the commonly used doping agents. Most of the methods for detecting GHRPs rely on urine samples. Serum as a matrix is highly desirable, but has been rarely used. In this issue, Ferro et al. [5], have devised a methodology for detection of GHRPs in serum. The first step of this process is involved in the removal of endogenous Ghrelin so as to avoid interference in the radiocompetition assay. The authors assessed the efficacy of this protocol in serum samples using healthy subjects administered with 100 µg of GHRP- 2 (bolus), 200 µg of GHRP-2 (intranasally), 200 µg of GHRP-6 (intranasally). Serum samples were collected at varying time points and assessed by radiocompetition assay. It was observed that GHRP-2 could be detected 8 hrs post-administration in the serum as opposed to 18 hrs in the urine samples. The detection windows for GHRP-6 in the serum and urine samples were very similar.

Atrazine (2-chloro-4-ethylamino-6-isopropylamino-1,3,5-triazine) is one of the most frequently used herbicide. As Atrazine is an endocrine disruptor, residual atrazine in produce poses a threat to human health. It adversely affects the hypothalamus, pituitary, and the reproductive system. In this issue, Sharma et al. [6], present a method for estimation of atrazine in agricultural produce. It involves Gas Chromatographic-Electron Capture Detection (GC-ECD) supported by solid-phase extraction (SPE). In this method, the samples were extracted and purified in 5 min (SPE), the subsequent GC-ECD detection took 20 min, making the method swift and easy. The method was found to be sensitive and precise, with a detection limit of 0.001µg/L. This method of Atrazine detection has a promising future.

Ethanolamines are a group of chemicals that have the properties of both amine and alcohol. These compounds are surfactants and are therefore used extensively in personal care products. Ethanolamines contain N-nitrosodiethanolamine (NDELA) as an impurity. NDELA is recognized as a hazardous carcinogen therefore, estimation of NDELA in Ethanolamine preparations is of paramount importance. Most of the current methods for NEDLA estimation comprise of multiple steps and therefore cumbersome. In this issue, Kuriakose et al. [7], developed a direct method for quantifying NDELA in ethanolamine by LC-MS. This method does not involve any prior sample preparation step and provides direct estimation of NDELA with a sensitivity of up to 10 ppb level in ethanolamine matrix. The recovery ranged between 97%-107%.

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