TRANSFER OF A CONVENTIONAL LC METHOD FOR THE SCREENING OF COUNTERFEIT ANTIMALARIAL MEDICINES TO UHPLC

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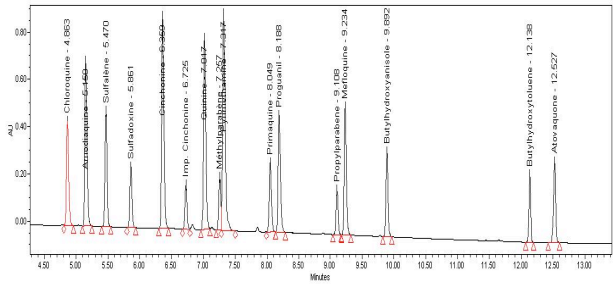
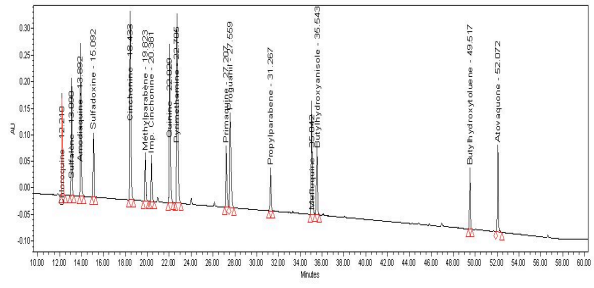
Malaria is by far the most important tropical parasitic disease worldwide and is responsible each year for more than 300 million acute illnesses and at least one million deaths. The disease that was previously controlled or even eradicated in more than one hundred countries located in the intertropical belt is now re-emerging in these areas, especially due to the resistance of anopheles against the means used for fighting vector-borne diseases. Adding the poor quality and the many counterfeits of the antimalarial drugs available on the Congolese pharmaceutical market, the country is facing a major public health problem which explains the interest in a LC control method for different trademarked drugs. Currently, the health policy, recommended by WHO is based on ACTs (Artemisinin-based combination therapy) [1]. For the development of the conventional LC method, a multivariate design of experiment strategy coupled to Design Space approach was used [2]. This preliminary study was focused on the following common antimalarial drugs: amodiaquine, atovaquone, chloroquine, cinchonine, lumefantrine, mefloquine, primaquine, proguanil, pyrimethamine, quinine, sulfadoxine and sulfalene, and 4 conservatives: methylparaben, propylparaben, butylhydroxyanisole and butylhydroxytoluene. The present study presents the results of a geometrical transfer [3] of this generic LC method – able to track multiple antimalarial drugs having as objective the detection of forgery or counterfeit of these medicines – to UHPLC. In addition, UHPLC was compared to conventional HPLC in terms of separation quality, separation speed, data processing time and data quality. To do so, two types of transfer methods were carried out: the first allow the same separating power as the existing HPLC method for a significant shorter analysis time (Figure (a)) and the second kept the same analysis time for a much greater separating efficiency (Figure (b)). To summarize, both methods present high quality data and low reagent consumption, therefore low production of organic waste, and the first one also combined an extremely fast turnaround time.

(a)



(b)



References:

1) Guideline for the treatment of malaria, WHO, (2006), 16.
2) P. Lebrun et al., Chemom. Intell. Lab. Syst., 91 (2008), 4-16 (http://hdl.handle.net/2268/1640).
3) D. Guillarme et al., Eur. J. Pharm. Biopharm., 68 (2008), 430-440.