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BOOK OF ABSTRACTS

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MICROFLUIDIC PAPER-BASED DEVICES AS DISPOSABLE, EASY-TO-USE, REAL-TIME QUANTIFICATION METHODS

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The demand for faster, user friendly, ready-to-use, and still accurate monitoring techniques has been increasing. The idea of having a solution on hand for instant analysis is appealing and has been gaining relevancy.

In this context, microfluidic paper-based analytical devices (µPADs) have, in recent years, provided a novel approach for conducting inexpensive, on-site analyte determinations. This approach could become an attractive alternative to the current monitoring techniques requiring specialized skills, laborious laboratory processes, or/and expensive equipment. The µPADs small dimensions, minimal consumption of both reagents and sample, together with employing inexpensive materials and ease of operation, has made them ideally suited for unskilled operators and regular monitoring.

The use of digital scanning as detection process has enabled to maintain the accuracy and reliability of the analysis in opposition to other paper-based visual indication techniques, with a positive/negative or concentration range response. Colourimetric reactions are generally employed as the concentration of analyte can be related to the colour intensity, which can be easily measured using a flatbed scanner and computer software (i.e. ImageJ) [1].

Overall, the analytical performance of the µPADs makes them quite attractive for rapid on-site analysis in many fields, namely environmental and biological samples. In this work, an overview of the advantages and limitations of this emerging quantification method is presented. The potential and versatility of µPADs is highlighted with some applications to both natural waters and saliva samples: determination of iron(III) in natural waters; calcium and ammonia determination in saliva.

[1] Jayawardane, B. M.; McKelvie, I. D.; Kolev, S. D. *Talanta* **2012** 100, 454–460.