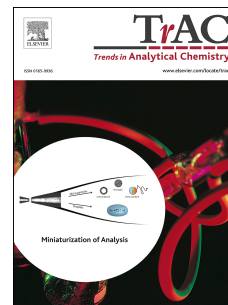


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Recent developments in analytical quantitation approaches for parabens in human-associated samples

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13
14 **ABSTRACT**

15
16 Parabens are an important class of antimicrobial compounds used as preservatives. Although they
17 are considered to be safe when used within specified concentration limits, concerns about their
18 potential toxicity have been raised due to their presence in cancerous breast tissues and their
19 association with estrogenic activity, various kinds of allergies, and the malfunctioning of
20 reproductive organs. The small quantities of parabens in human samples and complex nature of
21 biological matrices make it difficult to determine free and/or conjugated forms of parabens and their
22 metabolites. As such, it is desirable to develop sophisticated approaches for sample pretreatments and
23 their subsequent determination. This review presents recent developments in the extraction, pre-
24 concentration, and instrumental detection methods needed for the accurate quantification of parabens
25 in human samples. Accordingly, it will help us assess their potential impacts on human health
26 through proper depiction of their exposure routes to human.

27 Key words: Parabens; preservatives; extraction techniques; chromatography; human-associated
28 samples

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