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Food Supplements adulteration with undeclared synthetic phosphodiesterase type-5 drugs (PDE-5) inhibitors

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The use of plant food supplements (PFS) in developed countries is becoming increasingly popular mostly due to the consumers' widespread idea that natural products are safer and healthier than conventional pharmaceutical drugs [1]. However, in the last years, several studies have been showing the existence of gaps in PFS regulation that can result in insufficient quality control and intentional adulteration of these products [2]. Among the issues that can affect PFS safety, the illegal addition of pharmaceutical substances is of major concern, since unscrupulous producers can dope PFS to provide for quick effects.

Supplements used for sexual performance improvement are among the most popular PFS used by males. One of the major concerns in this type of product is the possible adulteration with drugs used for the treatment of erectile dysfunction, namely synthetic phosphodiesterase type-5 (PDE-5) inhibitor drugs, such as sildenafil, vardenafil and tadalafil which are approved prescription drugs being marketed as Viagra (Pfizer, USA), Levitra (Bayer Pharmaceuticals Co., Germany) and Cialis (Elli Lilly, USA), respectively. Since these drugs can present side effects, its illegal addition in PFS can seriously endanger consumers' health. In particular, individuals for whom conventional PDE-5 inhibitor drugs are contraindicated and consequently use food supplements as an alternative may be at risk if the clandestine addition of these drugs occurs. In the last years, the presence of this type of drugs have been detected by FDA in the US, and reported in food supplements commercialized in Asia, however studies regarding this issue in the EU are almost inexistent.

For the presented reasons, an analytical methodology based on the use of high performance liquid chromatography coupled to a fluorescence detector in series with a photodiode array (HPLC-FL-PDA) is proposed for the detection of PDE-5 inhibitors, namely sildenafil and its analogue acetildenafil, vardenafil and tadalafil, illegally added to supplements used for aphrodisiac purposes.

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