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# Rapid detection and identification of counterfeit and adulterated products of synthetic phosphodiesterase type-5 inhibitors with an atmospheric solids analysis probe.

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Following publication of DOI:10.1002/dta.115 in the February Issue; Drug Testing and Analysis Volume 2 Issue 2: 45-50, the following errors have been identified.

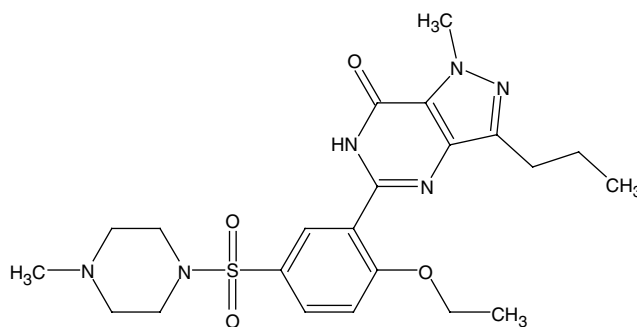
The title of the article:

Rapid detection and identification of counterfeit of adulterated products of synthetic phosphodiesterase type-5 inhibitors with an atmospheric solids analysis probe

Should read:

Rapid detection and identification of counterfeit and adulterated products of synthetic phosphodiesterase type-5 inhibitors with an atmospheric solids analysis probe.

The Sildenafil structure was incorrectly printed in Figure 1 and should read as follows:



In the results and discussion section the text as follows

The first three peaks (1–3) in Figure 3 represent the authentic pharmaceutical products. The peaks labeled 4–13 were obtained from the analysis of the internet purchased PDE5 pharmaceuticals. Even in manual mode, data from thirteen samples can be acquired in less than 20 minutes. The MS spectrum for the authentic, legitimate sildenafil, tadalafil and vardenafil are shown in Figure 4. Here we can see that the sildenafil sample gave rise to a major peak 475.2128 corresponding to an elemental composition of  $C_{22}H_{30}N_6O_4S$  and a fragment ion 410.2482. The tadalafil sample gave a peak with a  $m/z$  value of 390.1449 corresponding to  $C_{22}H_{20}N_3O_4$  and the vardenafil sample gave a peak with a  $m/z$  value of 489.2289 corresponding to  $C_{23}H_{33}N_6O_4S$ . All mass measurements were within 1 ppm. Although the visual appearance of the counterfeit tablets conformed to that of the genuine medicine in terms of colour, size, shape and mass, when analysed by ASAP the MS results indicated that they were clearly different. The sildenafil citrate tablets did indeed contain the correct active pharmaceutical ingredient ( $m/z$  475.2128), but those labeled to contain vardenafil ( $m/z$  489.2284) and tadalafil ( $m/z$  390.1454) samples did not (Figures 5). The vardenafil and tadalafil samples appeared to contain sildenafil in addition to the claimed active as the spectrum showed a peak with a  $m/z$  ratio of 475.2128 (see Figure 5).

Should read:

The peaks representing the authentic pharmaceutical products are 1, 7 and 8. The other peaks were obtained from the analysis of the internet purchased PDE5 pharmaceuticals. Even in manual mode, data from thirteen samples can be acquired in less than 20 minutes. The MS spectrum for the authentic, legitimate sildenafil, tadalafil and vardenafil are shown in Figure 4. Here we can see that the sildenafil sample gave rise to a major peak 475.2128 corresponding to an elemental composition of  $C_{22}H_{31}N_6O_4S$ . The tadalafil sample gave a peak with a  $m/z$  value of 390.1449 corresponding to  $C_{22}H_{20}N_3O_4$  and the vardenafil sample gave a peak with a  $m/z$  value of 489.2289 corresponding to  $C_{23}H_{33}N_6O_4S$ . All mass measurements were within 1.3 ppm. Although the visual appearance of the counterfeit tablets conformed to that of the genuine medicine in terms of colour, size, shape and mass, when analysed by ASAP the MS results indicated that they were clearly different. The sildenafil citrate tablets did indeed contain the correct active pharmaceutical ingredient ( $m/z$  475.2127), but those labeled to contain vardenafil ( $m/z$  489.2284) and tadalafil ( $m/z$  390.1454) samples did not (Figures 5). The vardenafil and tadalafil samples appeared to contain sildenafil and not the claimed active as shown in Figure 5.

Figure 4 was incorrectly printed. The correct version can be found below.

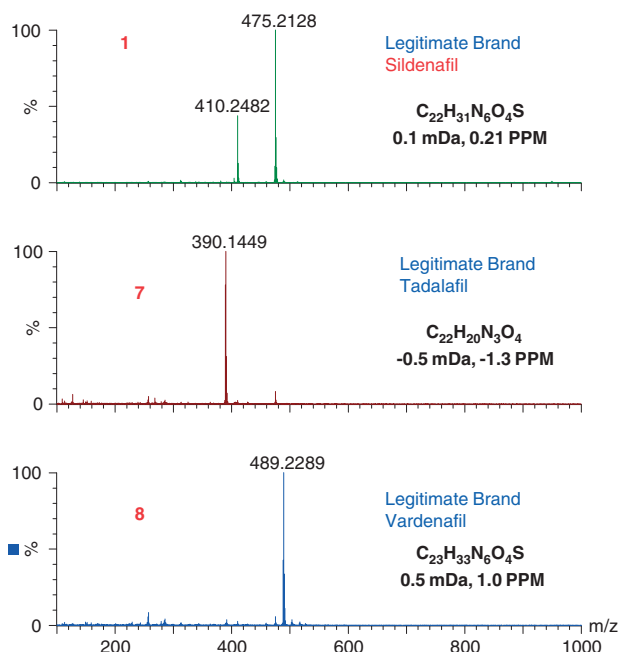


Figure 5 was incorrectly printed. The correct version can be found below.

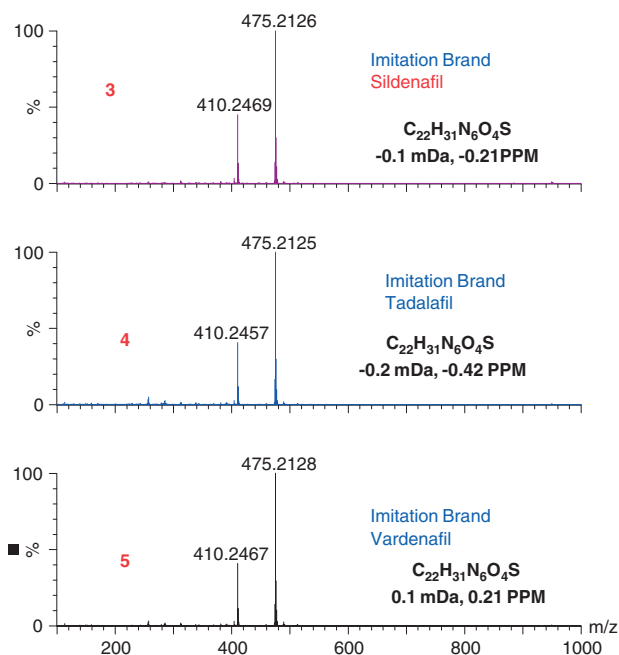


Figure 8 was incorrectly printed. The correct version can be found below.

