Erratum to: High-resolution mass spectrometric determination of the synthetic cannabinoids MAM-2201, AM-1220, AM-2232, and their metabolites in postmortem plasma and urine by LC/Q-TOFMS

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The publisher regrets the mistakes found in the paper.

First, Munehiro Katagi's name was misspelled to Munehiro Katagai. The correct name is now given in this paper.

Second, mistakes were found in Figures 1, 3, and 4 and in Table 2. The main panel labels were missing in Figures 1, 3, and 4 and Table 2 was incorrectly presented. The correct images and table are now given in this article.

The publisher sincerely apologizes to the authors.

In addition, the authors would like to inform of an error in the article title—instead of “High-resolution mass spectrometric determination of the synthetic cannabinoids MAM-2201, AM-2201, AM-2232, and their metabolites in postmortem plasma and urine by LC/Q-TOFMS,” the title should be “High-resolution mass spectrometric determination of the synthetic cannabinoids MAM-2201, AM-1220, AM-2232, and their metabolites in postmortem plasma and urine by LC/Q-TOFMS.” The correct title is now reflected in this paper.

The online version of the original article can be found at <http://dx.doi.org/10.1007/s00414-015-1257-4>.

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Fig. 1 **a** High-resolution mass spectra and **b** high-resolution product ion spectra of the parent drugs in postmortem plasma. **c** Chemical structures and assignment of fragment ions (**A** MAM-2201, **B** AM-1220, and **C** AM-2232)

Fig. 1 (continued)

Fig. 3 **a** High-resolution mass spectra and **b** high-resolution product ion spectra of metabolites in postmortem plasma. **c** Chemical structures and assignment of fragment ions (**A** 3-naphthoylindole (N-dealkyl metabolites of AM-1220 or AM-2232), **B** 3-(4-methyl-1-

naphthoyl)indole (N-dealkyl metabolite of MAM-2201), **C** mono-hydroxylated metabolite of AM1220, **D** di-hydroxylated metabolite of AM1220, **E** 5-hydroxypentyl metabolite of MAM-2201, and **F** COOH metabolite of MAM-2201)

Fig. 3 (continued)

Fig. 3 (continued)

A **c**

accurate mass	assigned formula	exact mass	error (ppm)
288.1022	$C_{19}H_{14}NO_2^+$	288.1019	1.0
160.0398	$C_9H_6NO_2^+$	160.0393	3.1
155.0487	$C_{11}H_7O^+$	155.0491	2.6
132.0448	$C_8H_6NO^+$	132.0444	3.0
127.0549	$C_{10}H_7^+$	127.0542	5.5

B **c**

accurate mass	assigned formula	exact mass	error (ppm)
302.1176	$C_{20}H_{16}NO_2^+$	302.1176	0.0
169.0646	$C_{12}H_9O^+$	169.0648	1.2
160.0391	$C_{12}H_9O^+$	160.0393	1.2
141.0697	$C_{11}H_9^+$	141.0699	1.4
132.0449	$C_8H_6NO^+$	132.0444	3.8
115.0543	$C_9H_7^+$	115.0542	0.9

Fig. 4 **a** High-resolution mass spectra and **b** high-resolution product ion spectra of metabolites in urine. **c** Chemical structures and assignment of fragment ions (A mono-hydroxylated metabolite of 3-naphthoylindole and A mono-hydroxylated metabolite of 3-(4-methyl-1-naphthoyl)indole)

Table 2 Validation data for quantitation analysis accuracy (ng/mL) precision (%RSD)

Compound name	Calibration range (ng/ml)	Linearity (r^2)	Recovery (%)	Matrix effect (%)	Accuracy (ng/ml)		Precision (%RSD)					
					Intra-day		Inter-day		Intra-day			
					4 ng/ml	20 ng/ml	40 ng/ml	40 ng/ml	4 ng/ml	20 ng/ml	40 ng/ml	40 ng/ml
MAM-2201 ^a	1–80 ^b	0.999	106	36	3.9	22	39	39	3.8	21	21	40
AM-1220 ^c	1–50 ^d	0.994	70	18	4.1	21	–	–	4.0	22	–	–
AM-2232 ^c	0.5–50 ^e	0.998	107	7.2	3.9	21	–	–	4.1	22	–	–
3-naphthylindole ^e	1–50 ^d	0.995	82	22	3.9	19	–	–	4.4	22	–	–
3-(4-methyl-1-naphthyl)indole ^c	1–50 ^d	0.995	104	33	3.9	18	–	–	4.1	22	–	–
5-hydroxypentyl metabolite of MAM-2201 ^a	1–80 ^b	0.996	109	17	3.6	20	37	37	3.6	21	20	37
COOH metabolite of MAM-2201 ^f	1–80 ^b	0.999	91	21	4.0	20	40	40	4.1	20	20	43

^a MAM-2201-d4 was used for IS^b Calibration points: 1, 5, 10, 25, 50, 80 ng/ml^c JWH-210 was used for IS^d Calibration points: 1, 5, 10, 25, 50 ng/ml^e Calibration points: 0.5, 1, 5, 10, 25, 50 ng/ml^f COOH metabolite-d5 of MAM-2201 was used for IS