Supplementary Materials: Distribution and Excretion of Arsenic Metabolites after Oral Administration of Seafood-Related Organoarsenicals in Rats

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Table S1. The recovery of arsenicals in organs and biological fluids after a single oral administration of DMA^V, AB, AC, and $TMAO^V$ into rats.

Organs/Body Fluids	As (% of Dose)			
	DMA^V	AB	AC	$TMAO^V$
Whole blood	72	0.7	0.9	≈0
Liver	1.9	3.2	11	≈0
Spleen	0.6	0.1	0.1	≈0
Urine	17	72	60	110
Faces	18	0.2	0.5	0.1
Total	109.5	76.2	72.5	110.1

Table S2. The estimated percentage of each arsenic metabolite in urine and feces. The values were calculated based on the peak areas on the chromatogram obtained by HPLC-ICP-MS equipped with the cation exchange column.

Administrated Arsenicals	Detected Arsenicals	Presence rate of As (%)			
		Urine		Feces	
		0–24 h	24–48 h	0–24 h	24–48 h
DMA^V	DMA^V	87.9	49.8	92.8	99.3
	$DMMTA^V$	4.9	17.7	5.8	5.2
	$DMDTA^V$	4.3	15.7	0.15	0.1
	$TMAO^V$	1.9	8.7	1	0.7
	$TMAS^V$	1.3	8.1	0.24	0.5
AB	AB	99.4	99.8	100	100
	$TMAO^V$	0.33	0.04	0	0
	$TMAS^V$	0.37	0.13	0	0
AC	AC	0.14	0.11	8	7
	AB	99.3	99.7	34	27
	$TMAO^V$	0.11	0.14	0	0
	$TMAS^V$	0.27	0.07	0	0
	unknown	0.22	0	58	66
$TMAO^V$	$TMAO^V$	93	72	58	53
	$TMAS^V$	6.6	27	28	28
	unknown	0.3	1	14	19

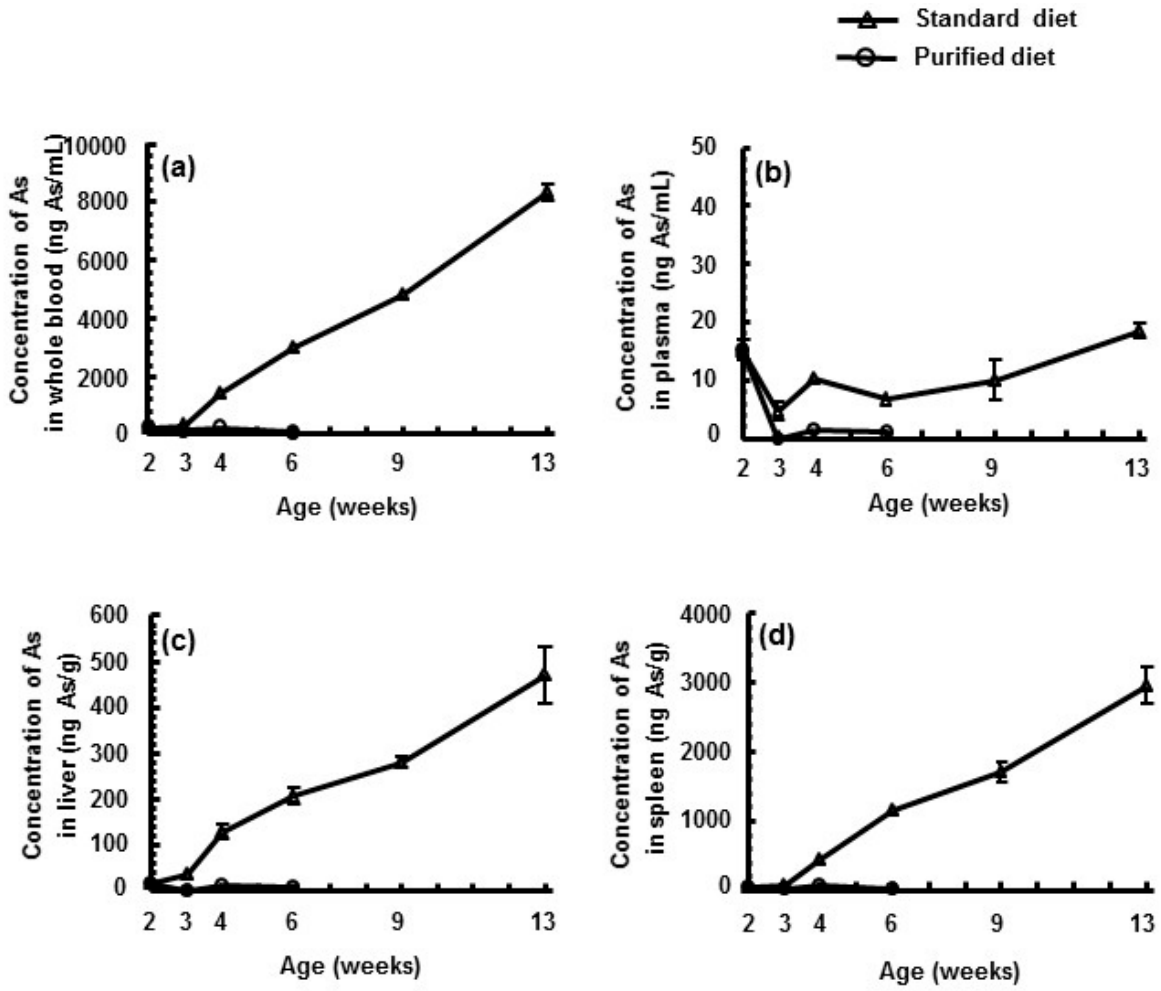

Figure S1. Time-course of changes in concentration of arsenic in (a) whole blood; (**b**) plasma; (**c**) liver, and (**d**) spleen in rats that were fed standard diet or arsenic-depleted diet. Values are presented as means ± SD (n = 4).

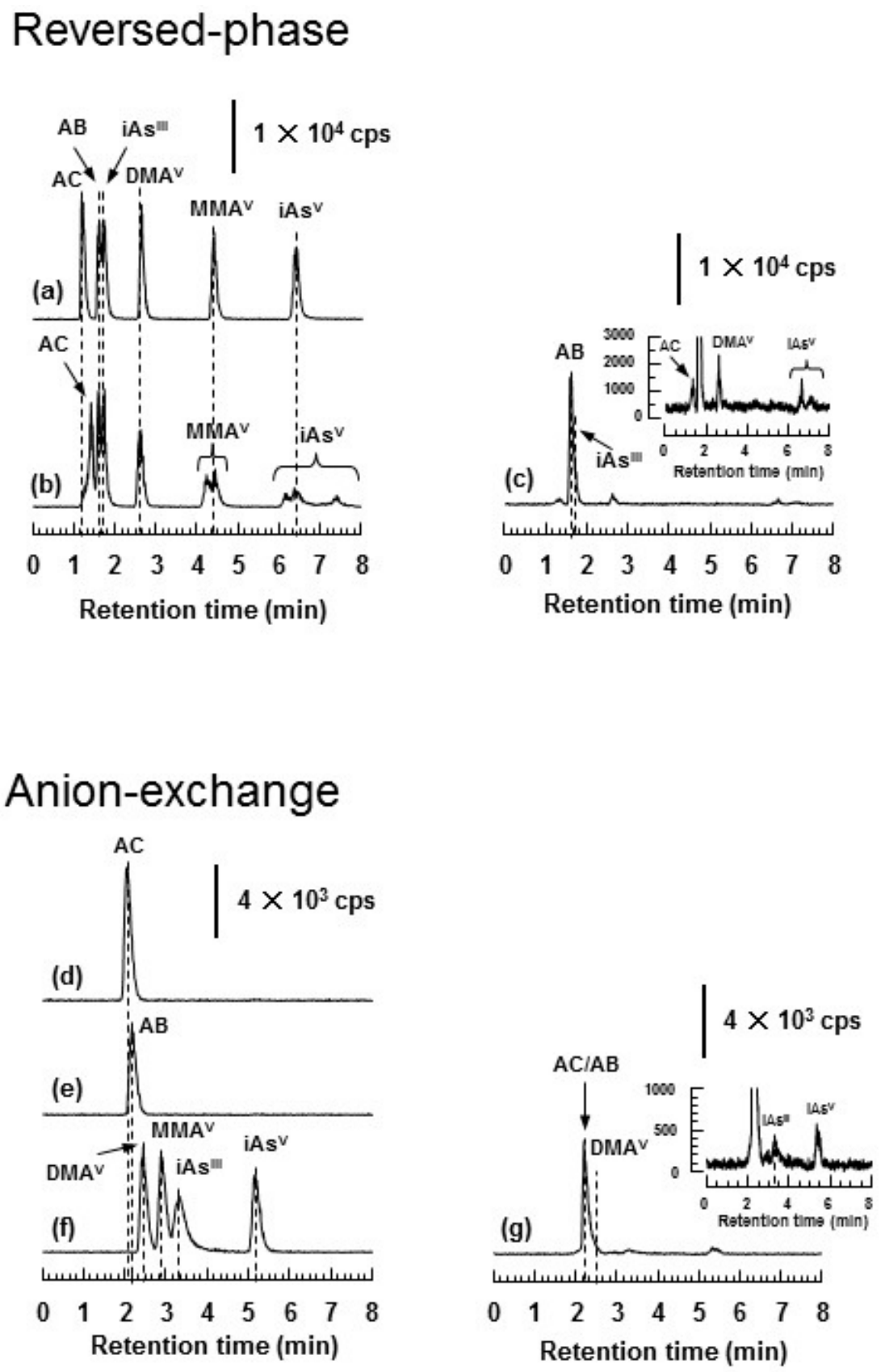

Figure S2. Elution profiles (**a**,**b**,**d**–**f**) of arsenic standards and (**c**,**g**) extract of standard diet on (**a**–**c**) reversed-phase or (**d**–**g**) anion-exchange columns, as assayed by HPLC-ICP-MS. A 20-μL sample was applied to the columns, which were eluted with pre-filtered (0.22 μm) mobile phase (see Table 1 for elution conditions). The vertical bars indicate the level of detection (counts per second).

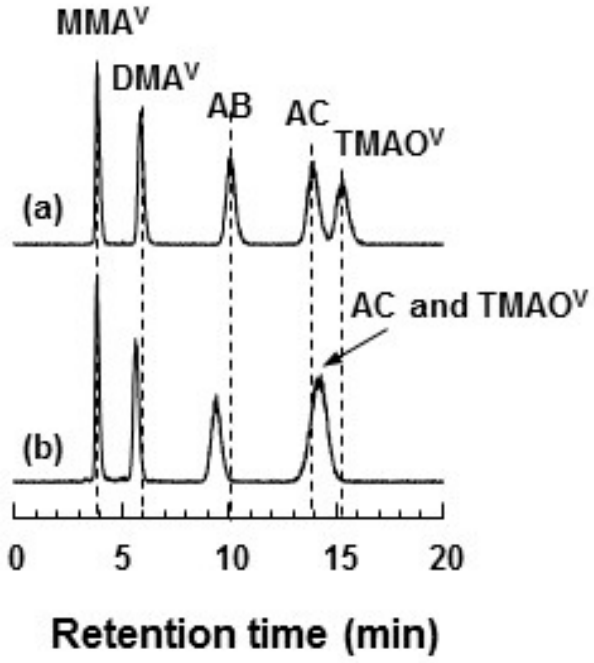

Figure S3. Elution profiles of arsenic standards in (**a**) distilled water and (**b**) non-treated urine on a cation-exchange column, as assayed by HPLC-ICP-MS. A 20-μL sample was applied to the columns, which were eluted with pre-filtered (0.22 μm) mobile phase (5 mM HNO_3, 8 mM NH_4NO_3, pH 2.44, 0.8 mL/min).

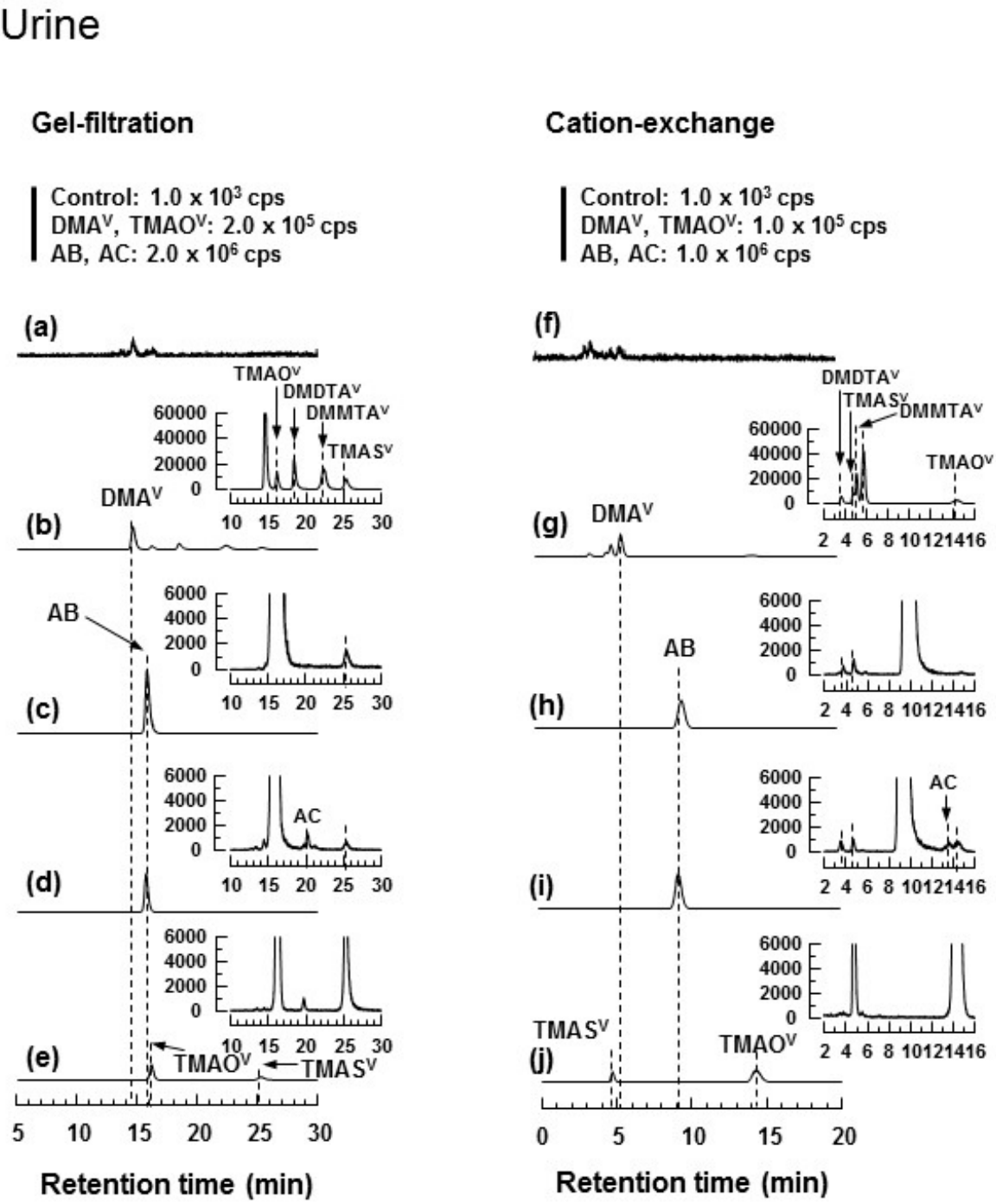

Figure S4. Elution profiles of urinary arsenic in rats. Urine samples were collected from 24 h to 48 h after oral administration of (**a**,**f**) deionized-distilled water (control); (**b**,**g**) DMA^V; (**c**,**h**) AB; (**d**,**j**) AC; or (**e**,**j**) $TMAO^V$ on (**a**–**e**) gel filtration column or (**f**–**j**) cation-exchange columns, as assayed by HPLC-ICP-MS. A 20-μL sample was applied to the columns, which were eluted with pre-filtered (0.22 μm) mobile phase (gel filtration column: 50 mM ammonium acetate, pH 6.5, 0.5 mL/min; cation-exchange column; 5 mM HNO_3, 8 mM NH_4NO_3, pH 2.44, 0.8 mL/min). The vertical bars indicate the level of detection (counts per second) for the main panels; separate scales (in cps) are provided for the insets.

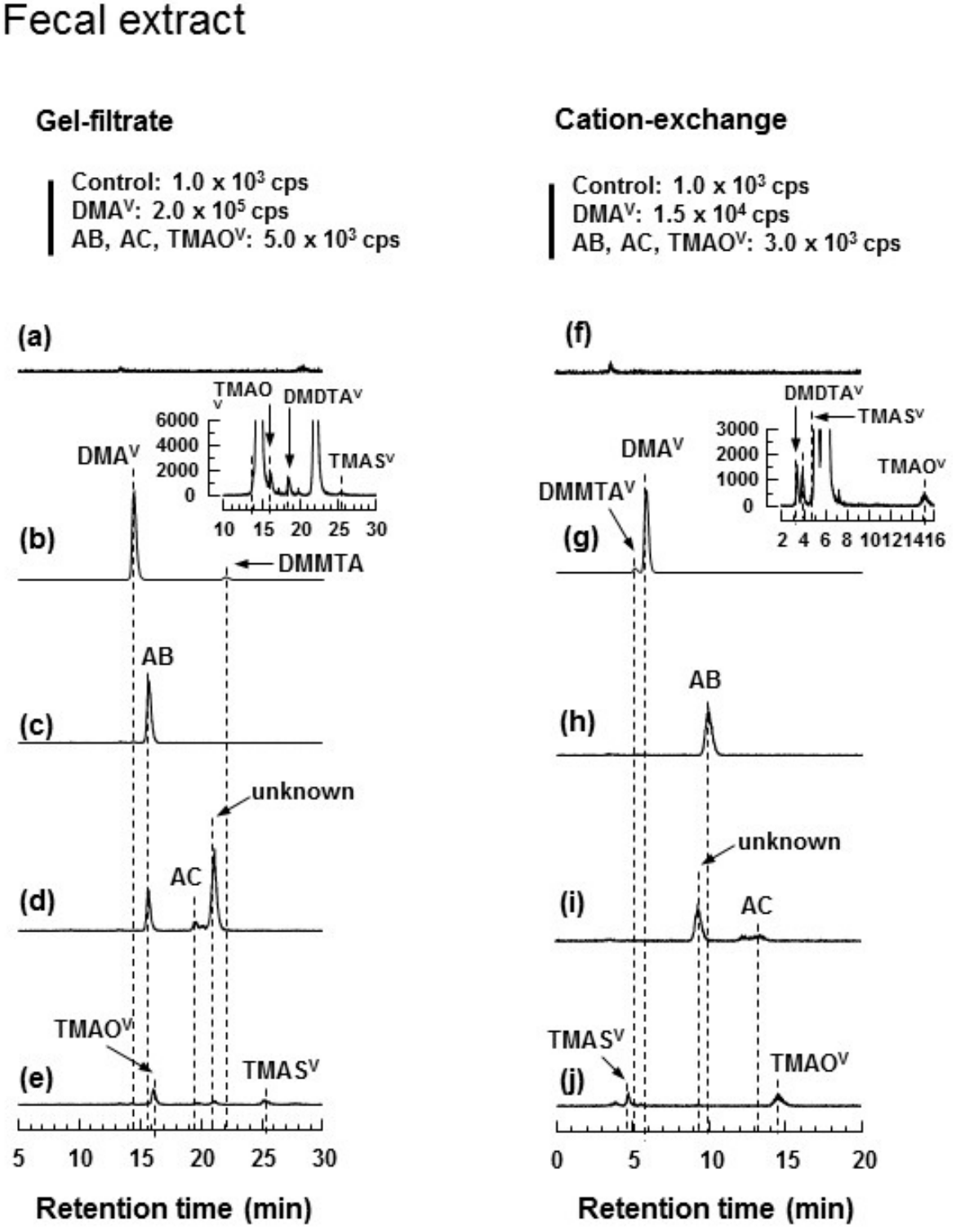

Figure S5. Elution profiles of extract of 24–48 h feces in rats after oral administration of (**a**,**f**) deionized-distilled water (control); (**b**,**g**) DMA^V; (**c**,**h**) AB; (**d**,**j**) AC; or (**e**,**j**) $TMAO^V$ on (**a**–**e**) gel filtration or (**f**–**j**) a cation-exchange columns, as assayed by HPLC-ICP-MS. A 20-μL sample was applied to the columns, which were eluted with pre-filtered (0.22 μm) mobile phase (gel filtration column: 50 mM ammonium acetate, pH 6.5, 0.5 mL/min; cation-exchange column: 5 mM HNO_3 + 8 mM NH_4NO_3, pH 2.44, 0.8 mL/min). The vertical bars indicate the level of detection (counts per second) for the main panels; separate scales (in cps) are provided for the insets.

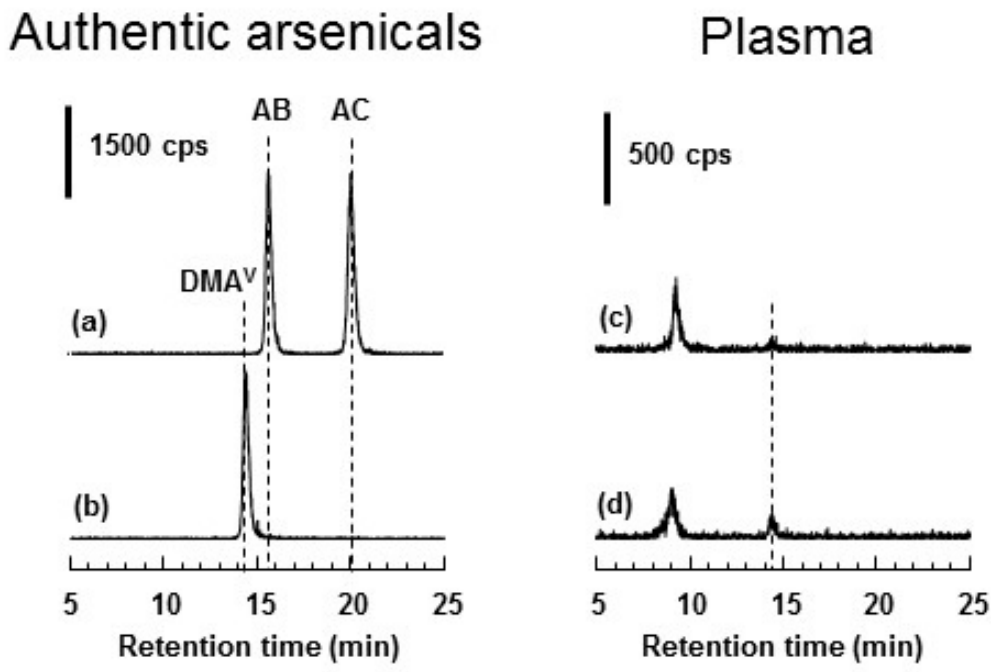

Figure S6. Elution profiles of (**a**,**b**) arsenic standards and (**c**,**d**) treated plasma in rats orally administered with AC on a gel filtration column, as assayed by HPLC-ICP-MS. To clarify the chemical form of arsenic eluted at the void volume in plasma in rats orally administered with AC (see Figure 4i), the plasma was applied to a gel-filtration column (Pharmacia NAP™-25 column; 150 mm × 4.9 mm, Pharmacia Biotech) equilibrated with 50 mM ammonium acetate. The void volume fraction was collected (**c**) and was treated overnight at room temperature with H_2O_2 (final concentration 5%) (**d**). A 20-μL sample was applied to the column, which was eluted with pre-filtered (0.22 μm) mobile phase (50 mM ammonium acetate, pH 6.5, 0.5 mL/min). The vertical bars indicate the level of detection (counts per second).

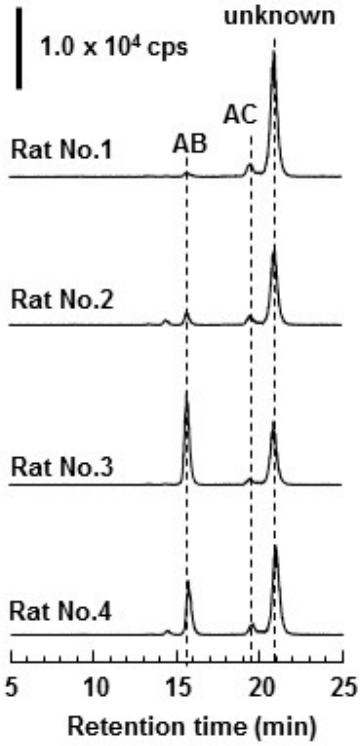

Figure S7. Inter-individual differences in arsenical elution profiles of fecal extract of rats orally administered with AC. For each animal, a 20-μL sample was applied to a gel-filtration column, which was eluted with pre-filtered (0.22 μm) mobile phase (50 mM ammonium acetate, pH 6.5, 0.5 mL/min). The vertical bar indicates the level of detection (counts per second).

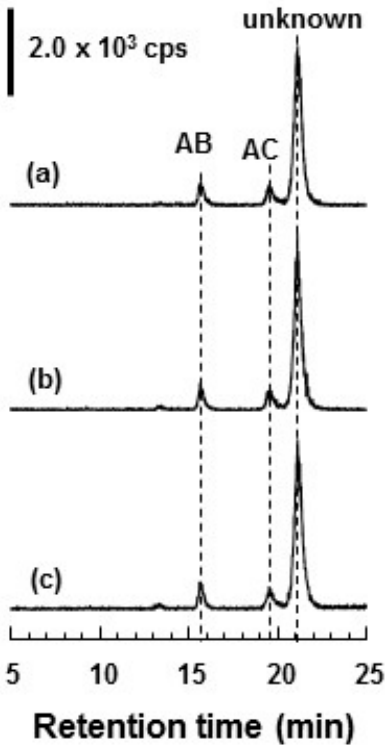

Figure S8. Arsenical elution profile of (**a**) non-; (**b**) heat-; (**c**) heat- and H_2O_2-treated fecal extracts of rats orally administered with AC. A 20-μL sample was applied to a gel-filtration column, which was eluted with pre-filtered (0.22 μm) mobile phase (50 mM ammonium acetate, pH 6.5, 0.5 mL/min). The vertical bar indicates the level of detection (counts per second).