

Supporting Information

Cellular internalisation of dissolved cobalt ions from ingested CoFe_2O_4 nanoparticles: *in vivo* experimental evidence

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	Experiment A	Experiment B	Experiment C	Experiment D
CoFe ₂ O ₄ NPs concentration	1000	2000	1000	2000
on leaves (µg/g leaf)	2000	/	2000	5000
CoCl ₂ concentration on	1000	2000	/	2000
leaves (µg/g leaf)	2000	/	/	5000
Animals/exposure group	20	15	10	15
Digestive gland membrane stability analyses (AO/EB)	+	+	+	-
Tissue distribution of Co and Fe (PIXE)	+	-	-	-
Cell distribution, colocalization of Co and Fe in gland cells (LE-XRF)	+	+	+	-
Concentration of Co and Fe in digestive glands (AAS)	+	-	-	+

Table S1. Parameters of experiments. Shown are concentrations of tested substances, number of exposed animals per group and measured parameters in different experiments (+ parameters analysed, - parameters not analysed).

Spectrum	In stats.	C	O	Mg	Si	Ca	Fe	Co	Pd	Au	Total
Spectrum 1	Yes	21.63	32.85		0.58	1.33	27.55	15.13	0.93		100.00
Spectrum 2	Yes	15.28	38.51	6.54	1.03	15.27	14.61	7.49	1.28		100.00
Spectrum 3	Yes	19.29	27.26	0.26	0.53	1.33	32.43	16.77	1.15	0.97	100.00
Spectrum 4	Yes	45.59	34.17	0.57	1.24	2.04	9.85	5.39	1.14		100.00
Spectrum 5	Yes		38.20	0.55	1.70	2.50	36.61	18.93	1.53		100.00
Max.		45.59	38.51	6.54	1.70	15.27	36.61	18.93	1.53	0.97	
Min.		15.28	27.26	0.26	0.53	1.33	9.85	5.39	0.93	0.97	

Table S2. EDX spectra analyses of abaxial leaf surface covered with suspension of CoFe_2O_4 nanoparticles (nominal concentration 5000 $\mu\text{g/g}$). Analytical results in weight % for analysed elements in all five spectra taken in areas marked in Figure S1B.

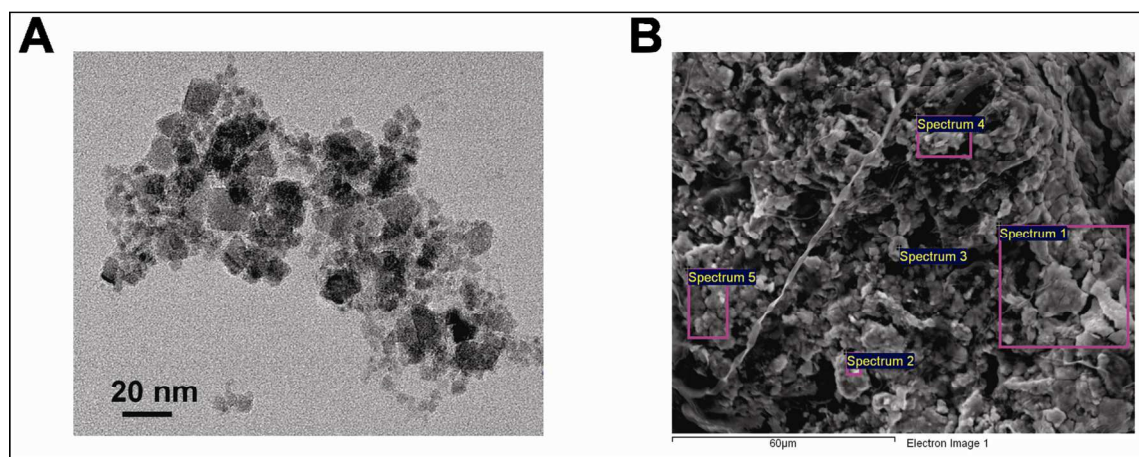


Figure S1. TEM characterization of CoFe_2O_4 nanoparticles and SEM/EDX analyses of CoFe_2O_4 nanoparticles on leaves from experiment D. (A) TEM micrograph of CoFe_2O_4 NPs. (B) Abaxial leaf surface covered with suspension of CoFe_2O_4 nanoparticles (nominal concentration $5000 \mu\text{g/g}$) with marked areas where EDX spectra were taken.

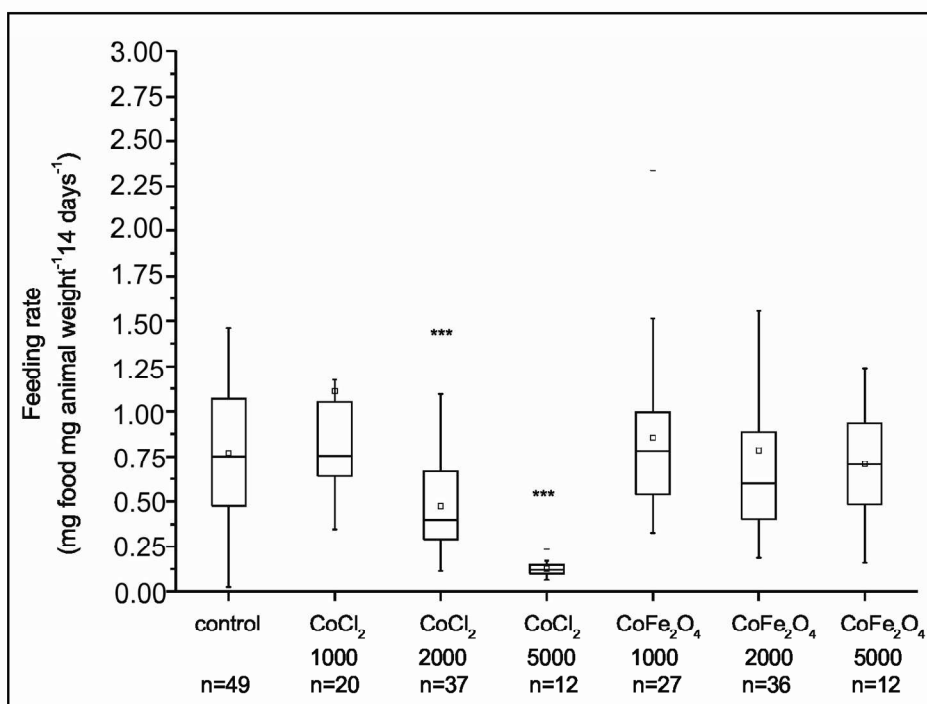


Figure S2. Feeding rate (mg of consumed leaf per mg of animal weight) of animals fed for 14 days on food dosed with CoCl₂ or CoFe₂O₄ nanoparticles. Symbols on the box plot represent minimum and maximum data values (whiskers), mean value ($\square$), 75th percentile (upper edge of box), 25th percentile (lower edge of box), median (line in box) and max and min value (-). Statistically significant differences between exposed and control animals are marked with *** ($p < 0.001$). Nominal exposure concentrations (1000, 2000 or 5000 μg CoCl₂ or nano-CoFe₂O₄/g of leaf) and the number of animals (n) per group are provided on the x-axis.