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### **Supplementary Material**

#### **Soil zinc application decreases arsenic and increases zinc accumulation in grains of zinc-biofortified wheat cultivars**

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## SUPPLEMENTARY FILE

Table S1. Selected physical and chemical properties of experimental soil

Parameters	Units	Values	References	
Soil texture	Sand	g kg <sup>-1</sup>	401	(Gee and Bauder 1986)
	Silt	g kg <sup>-1</sup>	429	
	Clay	g kg <sup>-1</sup>	170	
Soil textural class		Loam	USDA classification	
Soil Taxonomy		<i>Typic Haplocambids</i>	(Soil Survey Staff 2014)	
pH of saturated soil paste		7.91	(Allison <i>et al.</i> 1954)	
EC of filtrate (1:1 in distilled water)	dS m <sup>-1</sup>	1.13	(Allison <i>et al.</i> 1954)	
Calcium carbonate	g kg <sup>-1</sup>	47	(Leoppert and Suarez 1996)	
Soil organic matter	g kg <sup>-1</sup>	6.9	(Nelson and Sommers 1996)	
Extractable As	mg kg <sup>-1</sup>	0.13	(Giri <i>et al.</i> 2012)	
Extractable P	mg kg <sup>-1</sup>	7.97	(Olsen <i>et al.</i> 1954)	
Extractable K	mg kg <sup>-1</sup>	146	(Chapman <i>et al.</i> 1962)	
DTPA-extractable Cd	mg kg <sup>-1</sup>	0.02	(Lindsay and Norvell 1978)	
DTPA-extractable Fe	mg kg <sup>-1</sup>	3.24	(Lindsay and Norvell 1978)	
DTPA-extractable Zn	mg kg <sup>-1</sup>	0.62	(Lindsay and Norvell 1978)	

Table S2. Calculated *P* values, based on three-way ANOVA with interactions, for main and interactive effects of soil arsenic (As) spiking, soil zinc (Zn) application and wheat cultivars

Parameters	<b>Arsenic (As)</b>	<b>Zinc (Zn)</b>	<b>Cultivar</b>	<b>As × Zn</b>	<b>As × Cultivar</b>	<b>Zn × Cultivar</b>	<b>As × Zn × Cultivar</b>
Chlorophyll <i>a</i>	0.001	0.073	0.315	0.989	0.955	0.709	0.922
Chlorophyll <i>b</i>	0.000	0.001	0.159	0.768	0.879	0.788	0.995
Carotenoids	0.000	0.000	0.046	0.350	0.952	0.891	0.937
Straw yield	0.000	0.022	0.000	0.971	0.766	0.479	0.646
Root yield	0.004	0.010	0.805	0.157	0.718	0.663	0.863
Grain yield	0.000	0.000	0.064	0.030	0.510	0.716	0.750
Thousand-grain weight	0.070	0.003	0.000	0.796	0.899	0.174	0.978
Straw P concentration	0.000	0.001	0.105	0.372	0.918	0.684	0.960
Root P concentration	0.000	0.001	0.018	0.124	0.570	0.413	0.961
Grain P concentration	0.000	0.000	0.319	0.629	0.943	0.509	0.987
Straw P accumulation	0.000	0.000	0.002	0.637	0.919	0.535	0.742
Root P accumulation	0.013	0.000	0.153	0.014	0.850	0.280	0.764
Grain P accumulation	0.000	0.000	0.076	0.232	0.899	0.509	0.884
Straw As concentration	0.000	0.000	0.881	0.073	0.976	0.309	0.645
Root As concentration	0.000	0.000	0.004	0.026	0.014	0.393	0.942
Grain As concentration	0.000	0.000	0.000	0.000	0.008	0.781	0.516
Straw As accumulation	0.000	0.002	0.093	0.382	0.864	0.169	0.485
Root As accumulation	0.000	0.179	0.035	0.700	0.219	0.885	0.813
Grain As accumulation	0.000	0.000	0.000	0.168	0.015	0.946	0.483
Straw Zn concentration	0.000	0.000	0.002	0.693	0.792	0.341	0.853
Root Zn concentration	0.000	0.000	0.005	0.992	0.966	0.372	0.929
Grain Zn concentration	0.000	0.000	0.003	0.309	0.099	0.682	0.910
Straw Zn accumulation	0.000	0.000	0.001	0.065	0.874	0.148	0.999
Root Zn accumulation	0.000	0.000	0.032	0.964	0.830	0.369	0.999
Grain Zn accumulation	0.000	0.000	0.002	0.218	0.659	0.667	0.615
Post-harvest extractable As	0.002	0.002	0.426	0.668	0.863	0.749	0.815
Post-harvest extractable Zn	0.586	0.000	0.289	0.891	0.902	0.829	0.834

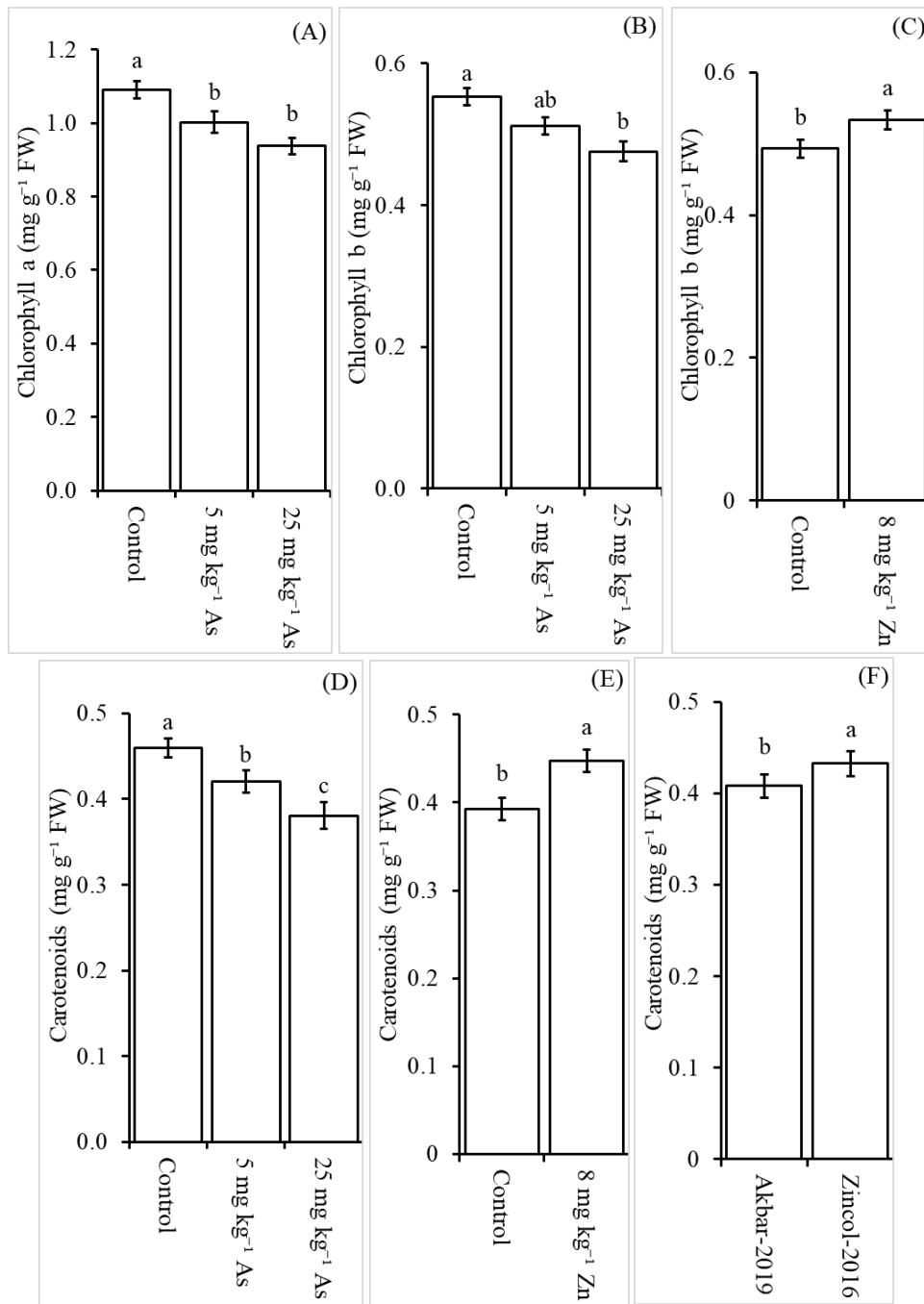


Figure S1. Main effects of soil arsenic (As) spiking, soil zinc (Zn) application and wheat cultivars on chlorophyll *a* [A], chlorophyll *b* [B, C] and carotenoids [D, E, F] in wheat leaves. Error bars are ± standard errors (n is 12 for As-spiking, 18 for Zn application and 18 for wheat cultivars). Different letters over the bars indicate significant differences, as determined by Tukey's HSD test ( $p \leq 0.05$ ).

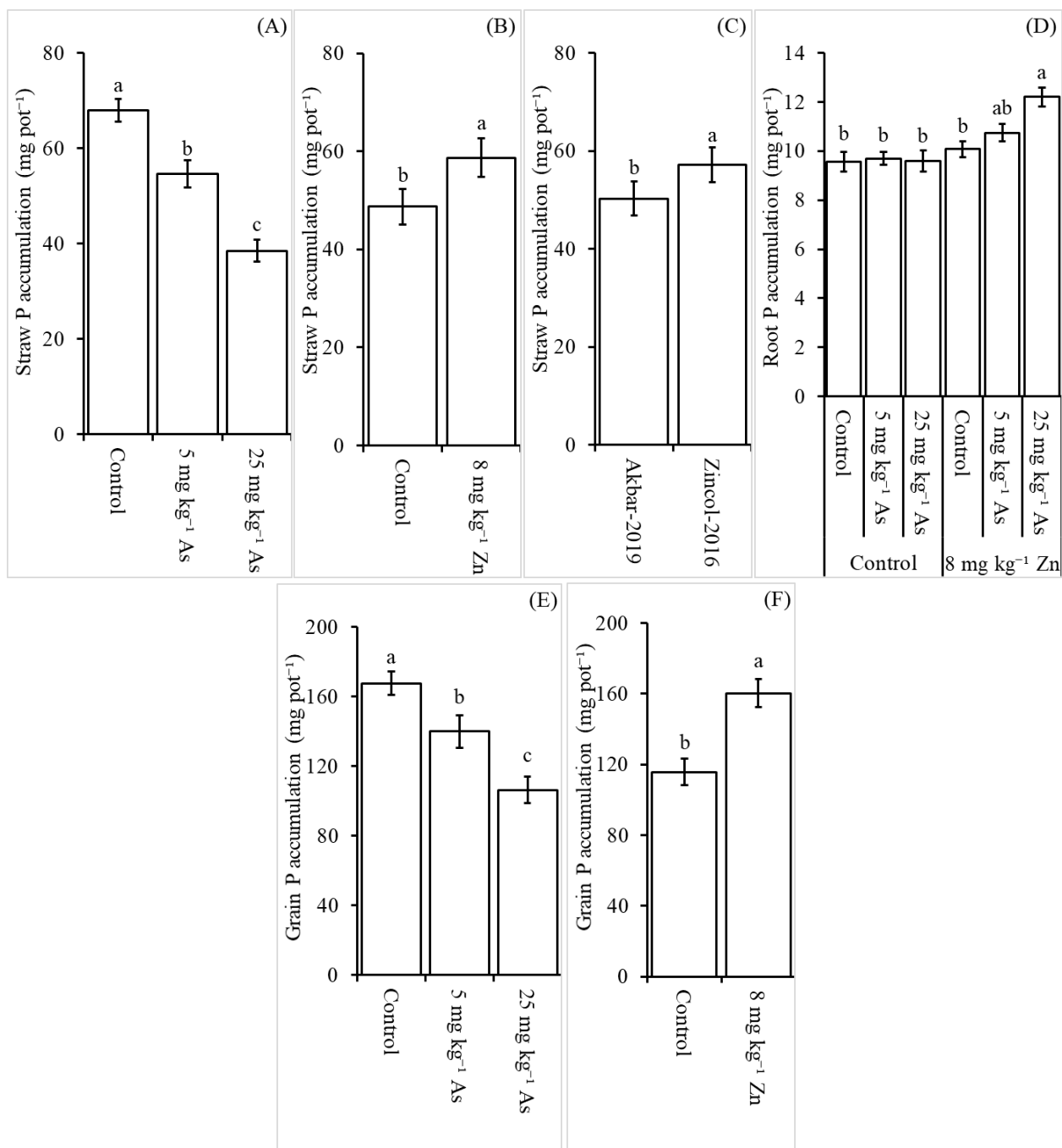


Figure S2. Significant main and interactive effects of soil arsenic (As) spiking, soil zinc (Zn) application and wheat cultivars on straw (A, B, C), root (D) and grain (E, F) P accumulation. Error bars are  $\pm$  standard errors (n is 12 for As-spiking, 18 for Zn application and 18 for wheat cultivars). Different letters over the bars indicate significant differences, as determined by Tukey's HSD test ( $p \leq 0.05$ ).