Physicochemical parameters affecting the perception of borehole water quality in Ghana

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SUPPLEMENTAL INFORMATION

Table S1. *Spearman's rank correlation matrix for measured water quality parameters. Correlation coefficients are shown in the top and p-values in bottom portions of the matrix. Statistically significant values (p<0.05) are bolded.*

	pH	TDS	Turb	Ca^{2+}	Mg^{2+}	TotH	TotA	Cl^-	Na^+	K^+	NO_3-N	NO_2-N	NH_3-H	F^-	SO_4^{2-}	PO_4^{3-}	Mn	Fe
pH	--	**0.60**	0.03	**0.72**	**0.66**	**0.70**	**0.82**	**0.27**	**0.42**	**0.28**	**-0.15**	**0.17**	**0.60**	**0.42**	**0.41**	0.09	**0.47**	**0.35**
TDS	<0.001	--	0.01	**0.76**	**0.76**	**0.85**	**0.69**	**0.72**	**0.81**	**0.62**	-0.08	**0.17**	**0.41**	**0.21**	**0.67**	-0.10	**0.49**	0.03
Turb	0.620	0.851	--	0.06	0.01	0.03	**0.21**	**-0.21**	0.05	0.07	**-0.38**	-0.01	-0.01	-0.05	-0.10	0.05	**0.21**	**0.45**
Ca^{2+}	<0.001	<0.001	0.297	--	**0.71**	**0.84**	**0.77**	**0.45**	**0.54**	**0.41**	-0.13	**0.20**	**0.47**	**0.26**	**0.47**	0.09	**0.51**	**0.26**
Mg^{2+}	<0.001	<0.001	0.871	<0.001	--	**0.88**	**0.71**	**0.54**	**0.57**	**0.43**	-0.11	**0.36**	**0.41**	**0.21**	**0.55**	-0.04	**0.49**	**0.18**
TotH	<0.001	<0.001	0.643	<0.001	<0.001	--	**0.75**	**0.52**	**0.58**	**0.42**	-0.07	**0.26**	**0.41**	**0.21**	**0.57**	-0.04	**0.54**	**0.23**
TotA	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	**0.30**	**0.61**	**0.43**	**-0.29**	**0.23**	**0.39**	**0.34**	**0.31**	**0.12**	**0.49**	**0.32**
Cl^-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	**0.71**	**0.66**	0.11	**0.34**	**0.31**	0.07	**0.66**	**-0.28**	**0.23**	**-0.33**
Na^+	<0.001	<0.001	0.361	<0.001	<0.001	<0.001	<0.001	<0.001	--	**0.78**	**-0.15**	**0.27**	**0.30**	**0.22**	**0.57**	-0.06	**0.36**	-0.13
K^+	<0.001	<0.001	0.257	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	**-0.20**	**0.27**	**0.20**	**0.16**	**0.54**	**-0.22**	**0.22**	**-0.23**
NO_3-N	0.010	0.187	<0.001	0.030	0.057	0.241	<0.001	0.054	0.009	<0.001	--	-0.03	-0.01	-0.07	0.04	-0.10	**-0.19**	**-0.24**
NO_2-N	0.003	<0.001	0.822	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.631	--	**0.14**	-0.08	**0.24**	**-0.23**	**0.16**	0.03
NH_3-H	<0.001	<0.001	0.889	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.923	0.016	--	**0.21**	**0.42**	**0.16**	**0.42**	**0.29**
F^-	<0.001	<0.001	0.378	<0.001	<0.001	<0.001	<0.001	0.259	<0.001	0.007	0.242	0.149	<0.001	--	**0.22**	-0.02	**0.21**	**0.17**
SO_4^{2-}	<0.001	<0.001	0.081	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.470	<0.001	<0.001	<0.001	--	**-0.14**	**0.32**	-0.09
PO_4^{3-}	0.11	0.070	0.386	0.103	0.475	0.535	0.033	<0.001	0.329	<0.001	0.086	<0.001	0.007	0.764	0.019	--	**0.18**	**0.19**
Mn	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.001	0.005	<0.001	<0.001	<0.001	0.003	--	**0.51**
Fe	<0.001	0.577	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	0.029	<0.001	<0.001	0.565	<0.001	0.003	0.135	<0.001	<0.001	--

Table S2. *Kendall's Tau correlation matrix for reported water quality problems. Correlation coefficients are shown in the top and p-values in bottom portions of the matrix. Statistically significant values (p<0.05) are bolded.*

	Scent	Salty taste	Particles	Oily sheen	Food staining
Scent	--	0.09	**0.27**	**0.47**	**0.44**
Salty taste	0.14	--	0.06	**0.15**	**0.24**
Particles	<0.001	0.34	--	**0.18**	**0.17**
Oily sheen	<0.001	0.01	0.002	--	**0.60**
Food staining	<0.001	<0.001	0.004	<0.001	--

Table S3. *Logistic regression models stratified by season*

Complaint	*WQ*	*Unit Δ (mg/L)*	*OR ($CI_{95\%}$)*	*p-value*	R^2
Dry season					
Salty taste	TDS	100	2.53 (1.64, 3.89)	<0.001	0.29
Scent	Iron	1.00	4.93 (2.03, 11.9)	<0.001	0.19
Oily sheen	Iron	1.00	9.39 (3.21, 27.4)	<0.001	0.33
Food staining	Iron	1.00	4.25 (1.98, 9.12)	<0.001	0.21
Rainy season					
Salty taste	TDS	100	1.68 (1.35, 2.10)	<0.001	0.12
Scent	Iron	1.00	2.47 (1.63, 3.73)	<0.001	0.09
Oily sheen	Iron	1.00	24.7 (8.06, 75.5)	<0.001	0.33
Food staining	Iron	1.00	5.91 (3.21, 10.9)	<0.001	0.23

Fig. S1. *Boxplots comparing the distribution of water quality values (y-axis) by presence or absence of the salty taste complaint (x-axis) in the dry (red) and rainy (blue) season samples.*

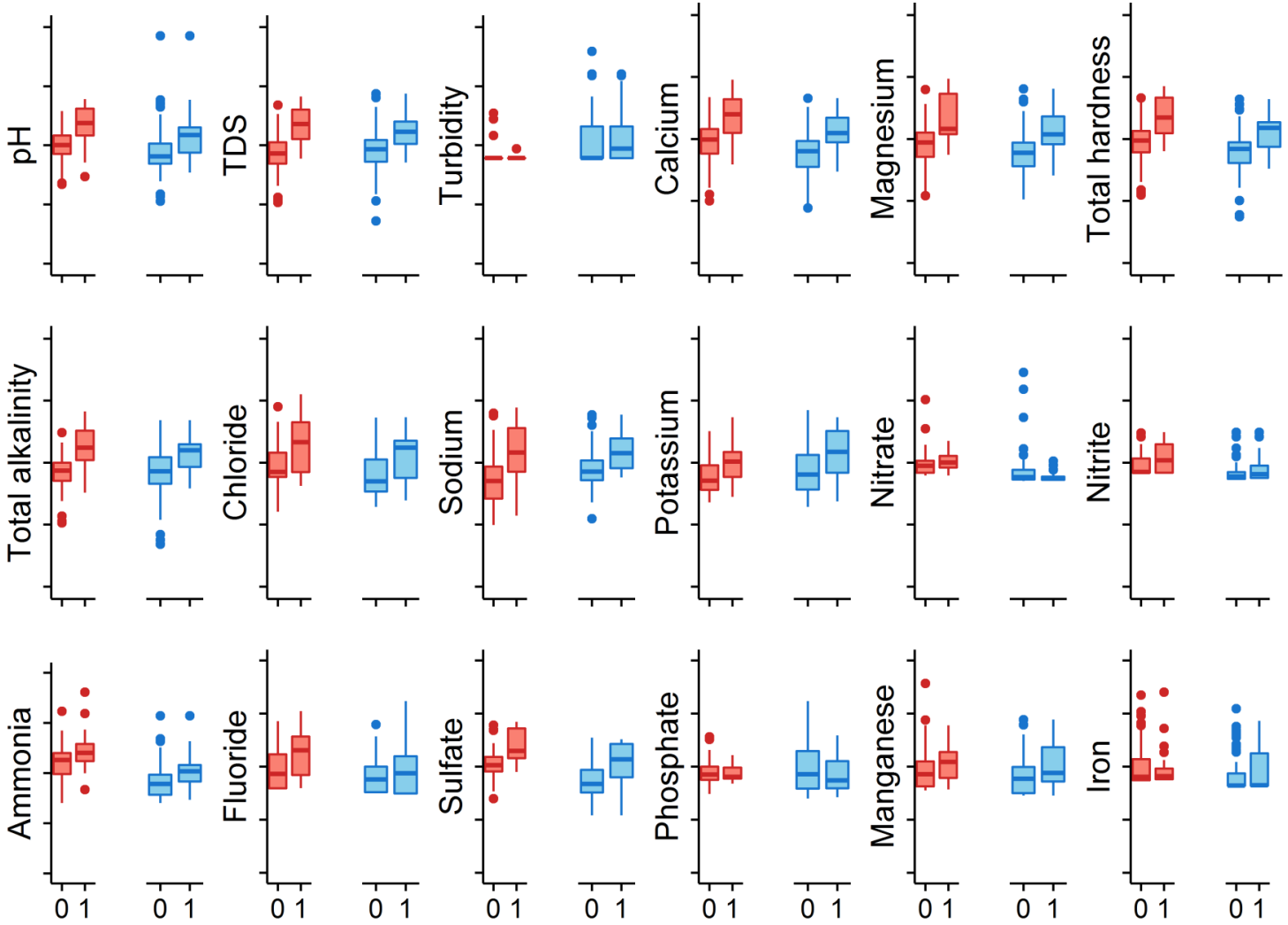

Fig. S2. *Boxplots comparing the distribution of water quality values (y-axis) by presence or absence of the particles complaint (x-axis) in the dry (red) and rainy (blue) season samples.*

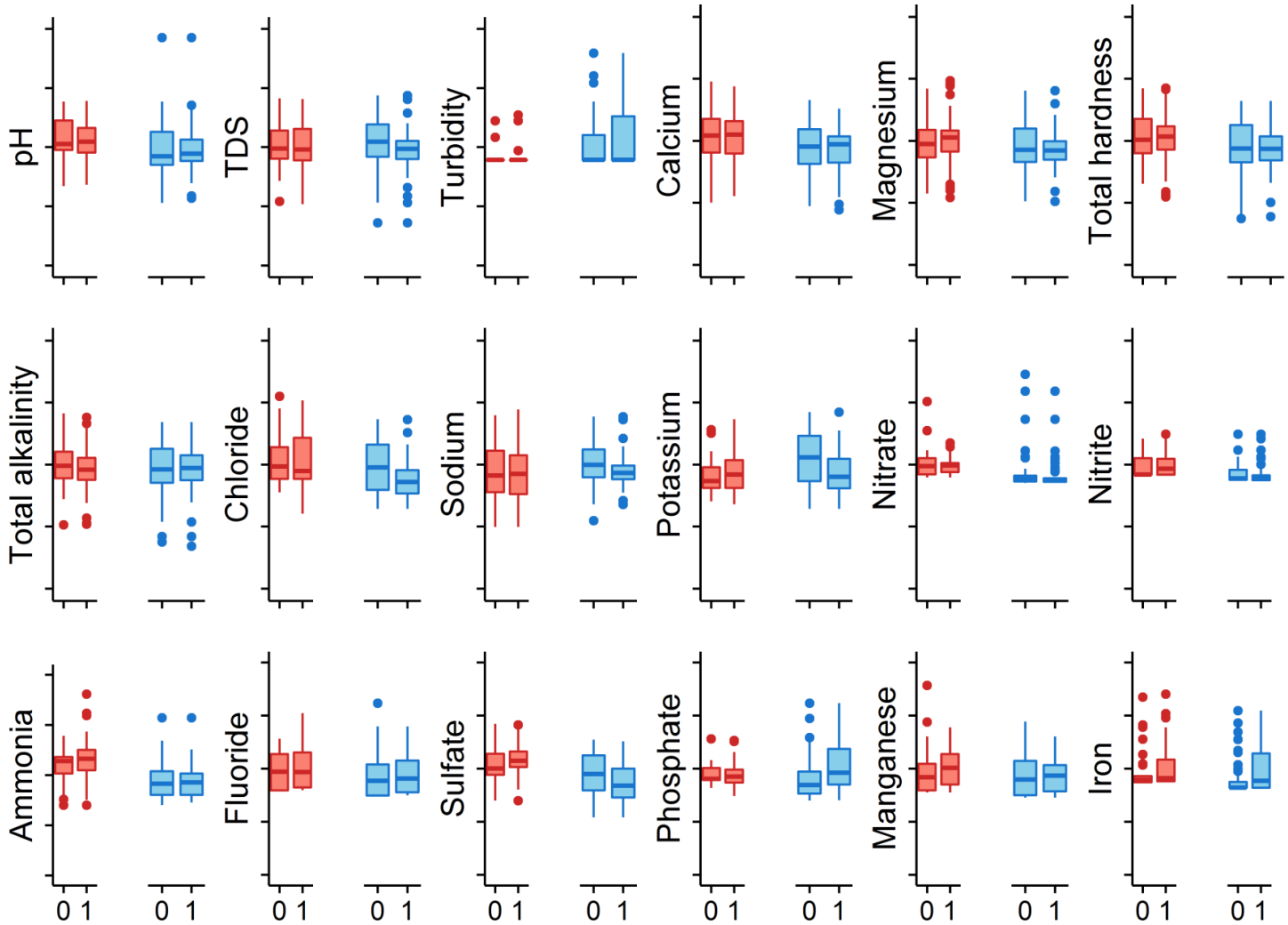

Fig. S3. *Boxplots comparing the distribution of water quality values (y-axis) by presence or absence of the scent complaint (x-axis) in the dry (red) and rainy (blue) season samples.*

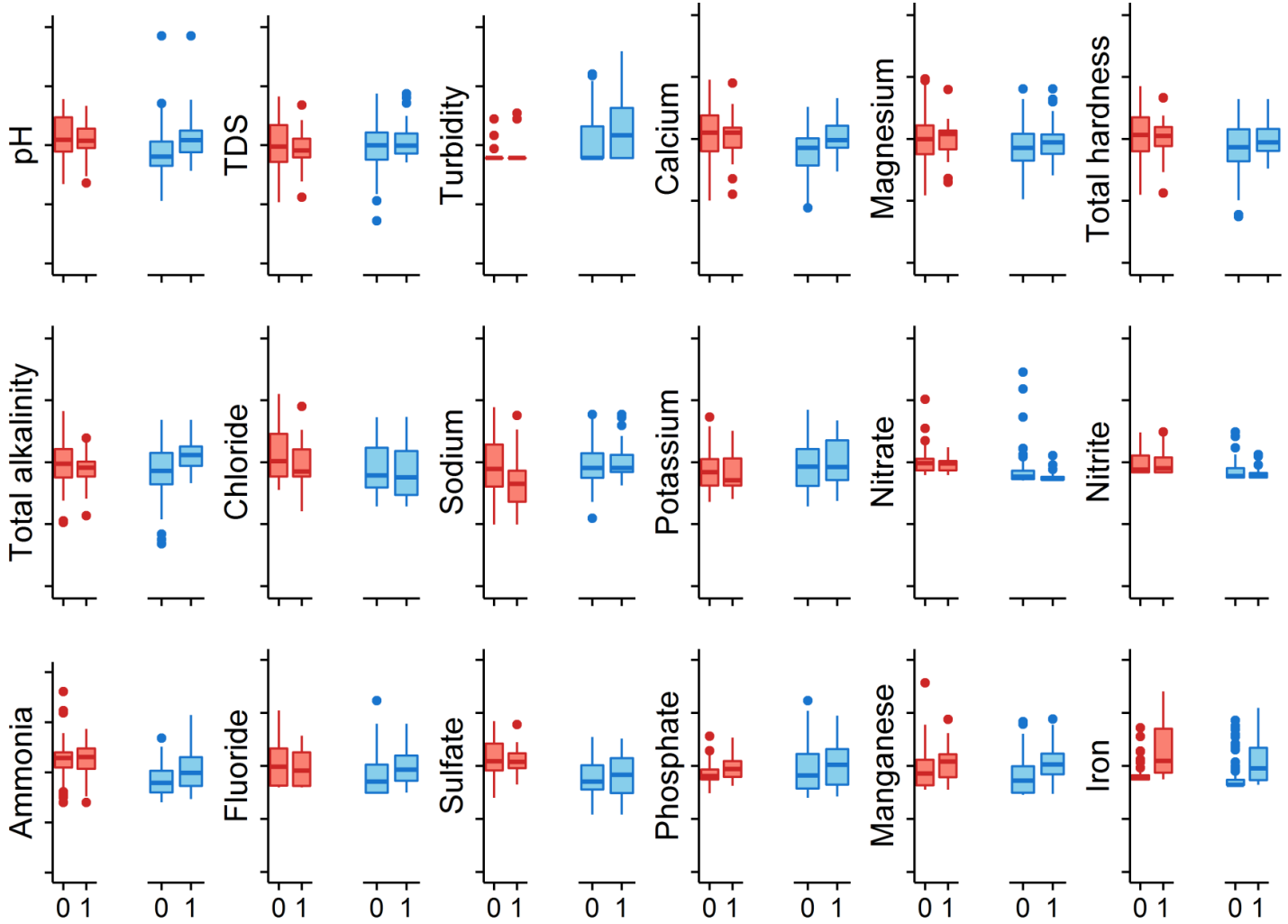

Fig. S4. *Boxplots comparing the distribution of water quality values (y-axis) by presence or absence of the oily sheen complaint (x-axis) in the dry (red) and rainy (blue) season samples.*

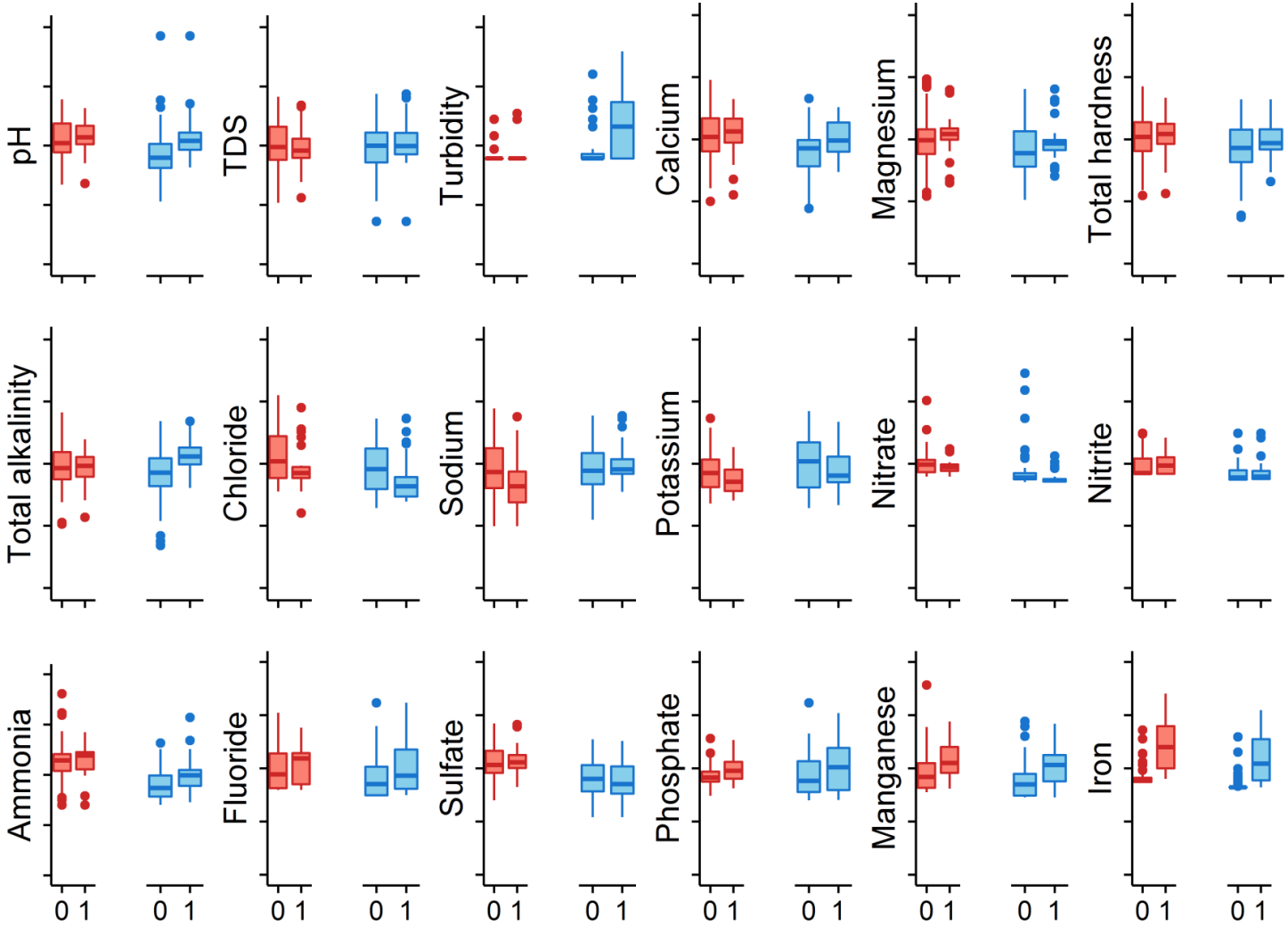

Fig. S5. *Boxplots comparing the distribution of water quality values (y-axis) by presence or absence of the food staining complaint (x-axis) in the dry (red) and rainy (blue) season samples.*

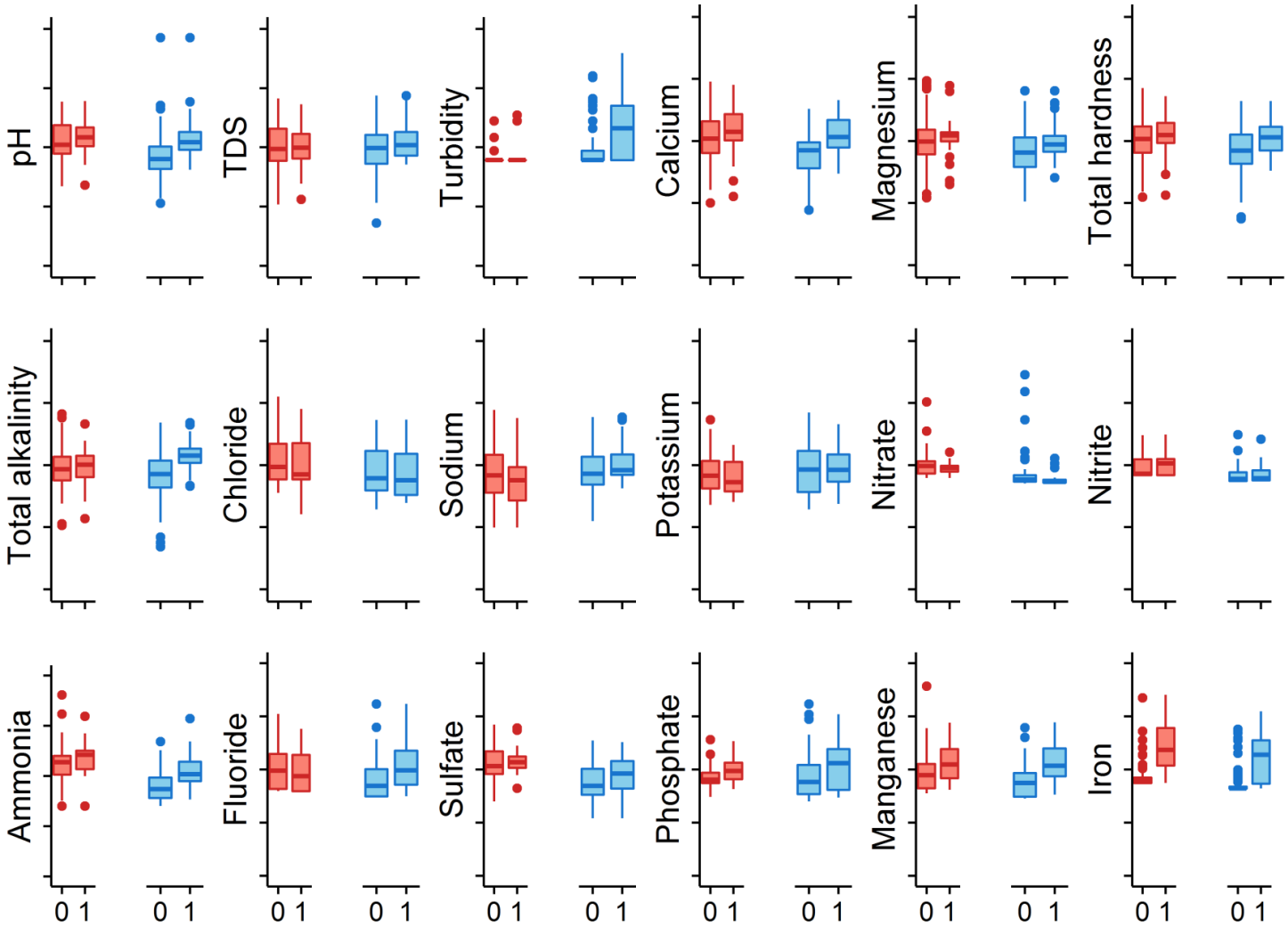

Fig. S6. *Map of geological formations (A) and interpolated surfaces for iron (B) and TDS (C); map of Ghana is shown in the bottom right corner with the insets specified. Geological formations were digitized from maps in Schluter, 2008.*