

## **Supplementary Material**

# **Azithromycin Adsorption onto Different Soils**

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**Table S1.** Basic details corresponding to the different soils used in this work. M: maize (corn) soils; VO: vineyard soils (Ourense province); VP: vineyard soils (Pontevedra province); F: forest soils

Code	Crop/Trees	Parent material	Mean temperature (° C)	Annual rainfall (mm)
M1	Corn	Schists, quartzite, pelite, sandstones and granites	12	995
M2	Corn	Schist and amphibolite	13	1270
M3				
M4				
M5				
M6				
VO1	Vineyard	Schist	11	850-1000
VO2		Slate		
VO3		Slate		
VO4	Vineyard	Granite and mica-schists	14.5	950
VO5				
VP1	Vineyard	Granite	13.8	1540
VP2				
VP3				
VP4	Vineyard	Granite	14	1000-2000
VP5				
VP6	Vineyard	Granite	13.8	1540
VP7				
FP	Pine,	Granite and gneiss	11.2	1389
FE	Eucalyptus,			
FR	Q. robur			

**Table S2.** Values corresponding to the basic parameters determined in the various soils studied. M: maize (corn) soils; VO: vineyard soils (Ourense province); VP: vineyard soils (Pontevedra province); F: forest soils. OC: organic carbon; OM: organic matter; N: nitrogen; eCEC: effective cation exchange capacity; Al<sub>ox</sub> and Fe<sub>ox</sub>: Al and Fe extracted with ammonium oxalate; Al<sub>pir</sub> and Fe<sub>pir</sub>: Al and Fe extracted with sodium pyrophosphate. Average values (n=3), with coefficients of variation always < 5%

Soil	pH <sub>H2O</sub>	OC	OM	N	Sand	clay	eCEC	Ca	Mg	Na	K	Al	Fe <sub>ox</sub>	Fe <sub>pir</sub>	Al <sub>ox</sub>	Al <sub>pir</sub>
		%					cmol <sub>c</sub> kg <sup>-1</sup>						mg kg <sup>-1</sup>			
M1	8.02	4.98	8.58	0.33	49.57	22.50	42.81	39.44	2.07	0.60	0.69	0.01	4140	1501	5351	2111
M2	5.33	2.66	4.59	0.27	43.42	24.65	6.88	5.35	0.67	0.02	0.44	0.40	5745	3159	3401	2871
M3	5.65	2.58	4.44	0.25	43.57	22.43	7.48	6.18	0.77	0.00	0.28	0.24	5780	3315	3881	2717
M4	5.01	2.04	3.52	0.21	45.64	22.43	5.94	4.58	0.67	0.10	0.17	0.43	4545	2923	2896	1945
M5	6.11	7.67	13.21	0.63	63.35	12.36	20.84	18.81	1.60	0.08	0.33	0.02	6990	3719	11651	6179
M6	6.43	5.56	9.59	0.53	59.28	16.50	24.35	21.65	1.60	0.16	0.93	0.02	6525	3231	4991	4087
VO1	5.6	0.63	1.09	0.06	61.40	13.14	5.96	2.85	0.73	1.39	0.31	0.68	1665	1273	634	1961
VO2	5.7	1.00	1.72	0.11	48.05	22.44	5.43	3.15	0.32	1.48	0.43	<0.06	2515	715	484	173
VO3	5.6	1.61	2.78	0.18	43.50	22.90	6.02	3.38	0.26	1.83	0.5	<0.06	2555	1047	894	1047
VO4	5.87	1.94	3.35	0.11	47.50	18.22	6.41	3.69	0.88	0.15	0.52	1.17	1980	1421	1601	1321
VO5	6.04	1.77	3.06	0.10	49.57	24.14	7.42	4.94	0.86	0.16	0.69	0.77	1790	1171	1556	1141
VP1	5.6	3.69	6.36	0.26	68.60	14.23	19.52	4.74	1.07	1.64	11.91	0.16	3045	2353	5739	4543
VP2	6.1	4.38	7.55	0.37	50.16	20.25	22.58	8.43	1.56	2.46	10.12	<0.05	3220	6309	4024	3897
VP3	6.1	2.83	4.88	0.23	60.62	18.35	37.23	6.33	1.48	18	11.4	<0.05	3460	4889	4294	3005
VP4	5.5	6.58	11.35	0.49	65.54	21.07	10.51	6.55	0.37	2.60	0.27	0.72	3540	6459	6624	14857
VP5	5.7	4.81	8.30	0.40	58.22	21.38	17.36	13.40	1.09	2.32	0.55	<0.10	2765	4519	3679	3965
VP6	7.05	2.43	4.19	0.14	67.42	22.43	9.09	8.11	0.51	0.08	0.37	0.02	1720	1225	3981	1703
VP7	7.27	3.56	6.14	0.22	67.50	12.22	12.32	10.53	1.04	0.44	0.27	0.04	1945	823	4576	1597
FP	4.88	7.70	13.27	0.48	69.35	12.86	6.43	0.07	0.00	0.11	0.09	6.16	5410	9239	8184	10767
FE	4.8	9.78	16.87	0.67	67.28	12.86	6.59	0.05	0.00	0.12	0.12	6.29	5805	8249	10189	11347
FR	4.68	7.15	12.32	0.49	69.35	14.86	7.48	0.18	0.07	0.00	0.22	7.01	3055	6789	5619	9457

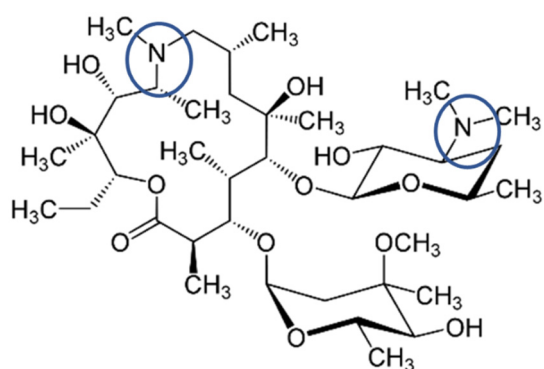
**Table S3.** AZM adsorption expressed in  $\mu\text{mol kg}^{-1}$  (and in percentage between brackets), for the soils studied, as a function of the concentration of antibiotic added. M: maize (corn) soils; VO: vineyard soils (Ourense province); VP: vineyard soils (Pontevedra province); F: forest soils. Average values (n=3), with coefficients of variation always < 5%

Soil		Soil		
M1	AZM added ( $\mu\text{mol/L}$ )	AZM adsorbed. concentration and %	VP2	AZM adsorbed. concentration and %
M1 M2	0	0 (0)	VP2 VP2	0 (0)
	2.5	0 (0)		6.25 (100)
	5	12.44 (100)		12.44 (100)
	10	24.88 (100)		25.00 (100)
	20	50.00 (100)		49.75 (100)
	30	74.63 (100)		75.00 (100)
	40	100 (100)		100.00 (100)
	50	115.77 (100)		116.35 (100)
	200	425.85 (85.60)		130.60 (26.12)
	400	750.40 (70.88)		383.40 (36.03)
	600	754.04 (52.30)		401.27 (27.83)
M2 M3	0	0 (0)	VP2 VP3	0 (0)
	2.5	6.25 (100)		6.22 (100)
	5	12.44 (100)		12.44 (100)
	10	24.88 (100)		25.00 (100)
	20	50.00 (100)		49.75 (100)
	30	75.00 (100)		75.00 (100)
	40	99.50 (100)		99.50 (100)
	50	115.77 (100)		116.35 (100)
	200	464.62 (93.39)		388.81 (78.15)
	400	824.86 (77.53)		555.55 (52.48)
	600	775.53 (54.05)		559.44 (38.80)
M3	0	0 (0)	VP3	0 (0)
	2.5	6.25 (100)		6.22 (100)
	5	12.44 (100)		12.44 (100)
	10	25.00 (100)		25.00 (100)
	20	49.75 (100)		49.75 (100)
	30	75.00 (100)		74.63 (100)
	40	99.50 (100)		99.50 (100)
	50	115.77 (100)		115.77 (100)
	200	479.98 (96)		277.23 (55.72)
	400	785.36 (74.18)		630.94 (59.60)
	600	825.44 (57.25)		667.08 (46.26)

M4	0	0 (0)	VP4	0	0 (0)
	2.5	6.22 (100)		2.5	6.25 (100)
	5	12.44 (100)		5	12.50 (100)
	10	25.00 (100)		10	24.88 (100)
	20	49.75 (100)	VP4	20	50.00 (100)
	30	74.63 (100)		30	75.00 (100)
	40	100.00 (100)		40	99.50 (100)
	50	116.35 (100)		50	116.35 (100)
	200	497.51 (100)	VP4 VP5 VP5	200	133.22 (26.78)
	400	849.73 (80.26)		400	622.20 (58.77)
M4 M5	600	799.38 (55.44)		600	638.92 (44.31)
M5 M6	0	0 (0)	VP5 VP6 VP6 VP7	0	0 (0)
	2.5	6.25 (100)		2.5	6.25 (100)
	5	12.50 (100)		5	12.44 (100)
	10	25.00 (100)		10	25.00 (100)
	20	50.00 (100)		20	50.00 (100)
	30	75.00 (100)		30	75.00 (100)
	40	99.50 (100)		40	99.50 (100)
	50	115.77 (100)		50	116.35 (100)
	200	497.51 (100)		200	368.40 (73.68)
	400	923.49 (88.97)		400	802.96 (75.47)
M5 M6	600	975.90 (68.70)		600	1125.46(78.05)
M6 VO1	0	0 (0)	VP6 VP7 VP7	0	0 (0)
	2.5	6.25 (100)		2.5	6.25 (100)
	5	12.44 (100)		5	12.50 (100)
	10	24.88 (100)		10	25.00 (100)
	20	49.75 (100)		20	49.75 (100)
	30	74.63 (100)		30	74.63 (100)
	40	100.00 (100)		40	100.00 (100)
	50	115.77 (100)		50	115.77 (100)
	200	500.00 (100)		200	490.20 (100)
	400	1063.98 (100)		400	1058.69 (100)
M6 VO1	600	1256.77 (87.16)		600	1318.21(93.25)
VO1	0	0 (0)	VP7 FP	0	0 (0)
	2.5	6.22 (100)		2.5	6.25 (100)
	5	12.44 (100)		5	12.44 (100)
	10	25.00 (100)		10	25.00 (100)
	20	49.75 (100)		20	50.00 (100)
	30	75.00 (100)		30	75.00 (100)
	40	100.00 (100)		40	100.00 (100)
	50	116.35 (100)		50	116.35 (100)
	200	500.00 (100)		200	497.51 (100)
	400	957.74 (90.47)		400	1027.40 (98.01)
VO1	600	941.88 (65.32)		600	1094.55 (76.67)

	0	0 (0)		0	0 (0)
	2.5	6.25 (100)		2.5	6.25 (100)
	5	12.50 (100)		5	12.44 (100)
	10	24.88 (100)		10	24.88 (100)
			FP		
			FE		
			FE		
			FR		
	20	49.75 (100)		20	49.75 (100)
			FP		
VO2	30	75.00 (100)		30	75.00 (100)
	40	99.50 (100)		40	99.50 (100)
	50	116.35(100)		50	116.35 (100)
	200	459.23 (91.85)		200	174.23 (35.54)
	400	570.73 (53.64)	FP	400	186.81 (17.99)
	600	690.96 (47.92)	FE	600	205.02 (14.22)
VO2			FE		
VO3	0	0 (0)	FR	0	0 (0)
	2.5	6.25 (100)	FE	2.5	6.25 (100)
	5	12.50 (100)	FR	5	12.50 (100)
	10	25.00 (100)	FR	10	24.88 (100)
	20	50.00 (100)		20	49.75 (100)
	30	75.00 (100)		30	75.00 (100)
	40	99.50 (100)		40	100.00 (100)
	50	116.35 (100)		50	116.35 (100)
	200	497.51 (100)		200	175.00 (37.26)
	400	947.65 (89.07)		400	186.73 (19.79)
	600	933.52 (64.73)	FE	600	187.29 (15.95)
VO3			FR		
VO4	0	0 (0)	FR	0	0 (0)
	2.5	6.22 (100)	FR	2.5	6.22 (100)
	5	12.50 (100)		5	12.50 (100)
	10	24.88 (100)		10	24.88 (100)
	20	50.00 (100)		20	49.75 (100)
	30	74.63 (100)		30	74.63 (100)
	40	100.00 (100)		40	99.50 (100)
	50	116.35 (100)		50	116.35 (100)
	200	492.61 (100)		200	183.57 (35)
	400	1048.26 (100)		400	209.51 (17.73)
	600	1229.38 (85.26)		600	228.84 (13.25)
VO4					
VO5	0	0 (0)	FR		
	2.5	6.25 (100)			
	5	12.50 (100)			
	10	25.00 (100)			
	20	50.00 (100)			
	30	75.00 (100)			
	40	100.00 (100)			
	50	116.35 (100)			
VO5	200	490.20 (100)			
	400	1043.12 (100)			

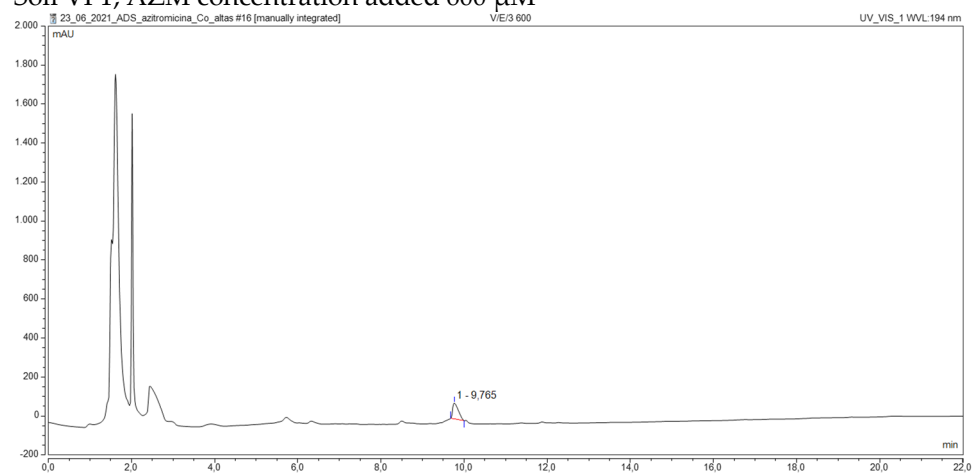




**Figure S2.** Molecular structure of AZM with amine groups remarked



Soil VP1; AZM concentration added 600  $\mu$ M



Soil M1; AZM concentration added 600  $\mu$ M

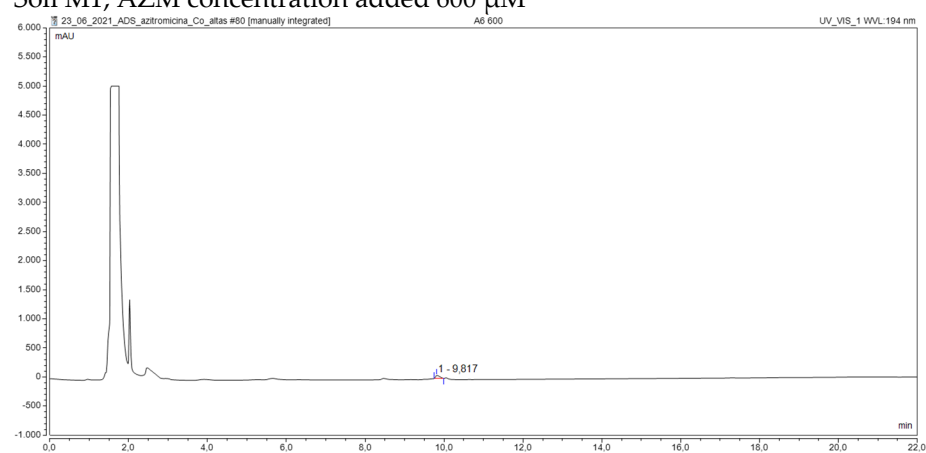


Figure S3. Selected chromatograms corresponding to AZM adsorption onto soils