

Crab bioturbation and seasonality control nitrous oxide emissions in semiarid mangrove forests (Ceará, Brazil)

Xosé L. Otero ¹, José M. C. Araújo Jr. ², Diego Barcellos ³, Hermano M. Queiroz ³, Danilo J. Romero ³, Gabriel N. Nóbrega ⁴, Marcos Siqueira Neto ⁵ and Tiago O. Ferreira ^{3,*}

¹ CRESTUS Institute. Departamento Edafología e Química Agrícola, Facultade de Bioloxía. Universidade de Santiago de Compostela, Rúa Lope G Marzoa, s/n. Campus sur. Santiago de Compostela, Spain. 15782

² Graduate Program in Ecology and Natural Resources, Department of Biology, Campus of Pici, Federal University of Ceará, Fortaleza, CE, Brazil. 60440

³ Department of Soil Science, College of Agriculture Luiz de Queiroz, University of São Paulo, ESALQ/USP, Av. Pádua Dias 11, Piracicaba, SP, Brazil. 13418

⁴ Graduate Program in Geoscience (Geochemistry), Department of Geochemistry, Federal Fluminense University. Outeiro de São João Batista s/n, Campus do Valonguinho, Centro, Niterói, RJ, Brazil. 24020

⁵ Laboratório de Biogeoquímica Ambiental, Centro de Energia Nuclear na Agricultura, CENA/USP, Av. Centenário 303, Piracicaba, SP, Brazil. 13400

* Correspondence: toferreira@usp.br

Table S1. *p*-values for Eh measurements among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.2257	0.9857	0.0004
Bioturbated/Dry	0.2257	1	0.1096	0.1601
Crab-Exclusion/Rainy	0.9857	0.1096	1	< 0.0001
Crab-Exclusion/Dry	0.0004	0.1601	< 0.0001	1

Table S2. *p*-values for pH measurements among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.0634	0.9857	0.0004
Bioturbated/Dry	0.0634	1	0.1096	0.5084
Crab-Exclusion/Rainy	0.9857	0.1096	1	0.0016
Crab-Exclusion/Dry	0.0004	0.5084	0.0016	1

Table S3. *p*-values for TOC measurements among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.0171	0.1601	0.0463
Bioturbated/Dry	0.0171	1	0.8224	0.9857
Crab-Exclusion/Rainy	0.1601	0.8224	1	0.9544
Crab-Exclusion/Dry	0.0463	0.9857	0.9544	1

Table S4. *p*-values for TN measurements among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.9857	0.8999	0.0725
Bioturbated/Dry	0.9857	1	0.9857	0.1601
Crab-Exclusion/Rainy	0.8999	0.9857	1	0.3069
Crab-Exclusion/Dry	0.0725	0.1601	0.3069	1

Table S5. *p*-values for TS measurements among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.0171	0.9982	0.0030
Bioturbated/Dry	0.0171	1	0.0099	0.9544
Crab-Exclusion/Rainy	0.9982	0.0099	1	0.0016
Crab-Exclusion/Dry	0.0030	0.9544	0.0016	1

Table S6. *p*-values for C:N ratios among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	< 0.0001	0.5084	0.0055
Bioturbated/Dry	< 0.0001	1	0.0171	0.7263
Crab-Exclusion/Rainy	0.5084	0.0171	1	0.2257
Crab-Exclusion/Dry	0.0055	0.7263	0.2257	1

Table S7. *p*-values for emissions of N₂O among Sites/Seasons (non-parametric Friedman).

Site/Season	Bioturbated/Rainy	Bioturbated/Dry	Crab-Exclusion/Rainy	Crab-Exclusion/Dry
Bioturbated/Rainy	1	0.0008	0.020	0.1601
Bioturbated/Dry	0.0008	1	< 0.0001	0.3069
Crab-Exclusion/Rainy	0.020	< 0.0001	1	0.0099
Crab-Exclusion/Dry	0.1601	0.3069	0.0099	1

Table S8. Correlation-based principal component analysis (PCA) of soil parameters in wet and dry seasons. Eigenvalues and % of variation explained by the first 2 ordination axes (PC1 and PC2) is given as well as linear coefficients (eigenvector).

	PC1	PC2
Eigenvalue	3.20	1.47
Variability (%) after Varimax rotation	48.07	29.63
Cumulative	48.07	77.71
Eigenvector		
pH	0.8414	0.1656
Eh	0.8671	-0.0657
TOC	0.2430	0.8809
TN	-0.0297	0.8961
TS	0.7785	0.3972
N ₂ O	-0.8711	-0.0977
Squared cosines of the variables after Varimax rotation		
pH	0.7079	0.0274

Eh	0.7518	0.0043
TOC	0.0591	0.7760
TN	0.0009	0.8030
TS	0.6061	0.1578
N ₂ O	0.7587	0.0095

Values in bold correspond for each variable to the factor for which the squared cosine is the largest. N₂O: nitrous oxide emission; Eh: redox potential; TOC: total organic carbon; TN: total nitrogen content; TS: total sulfur content.



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