

Impactes ecológicos de espécies invasoras aquáticas em Portugal: dos indivíduos aos ecossistemas

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Nível Individual e Populacional

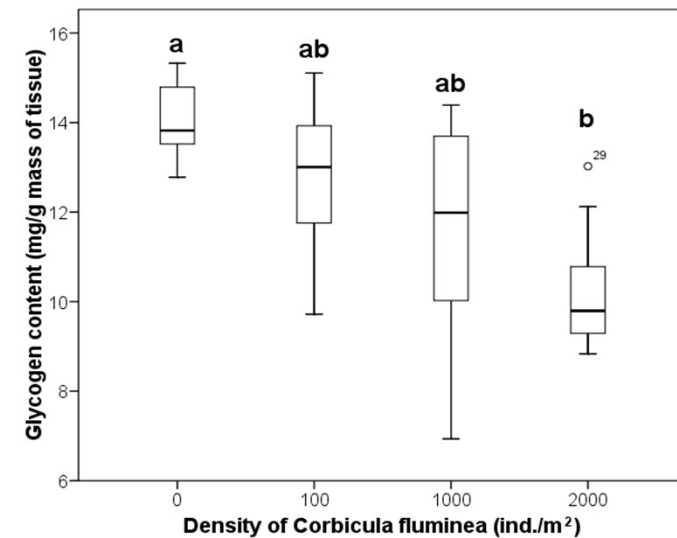
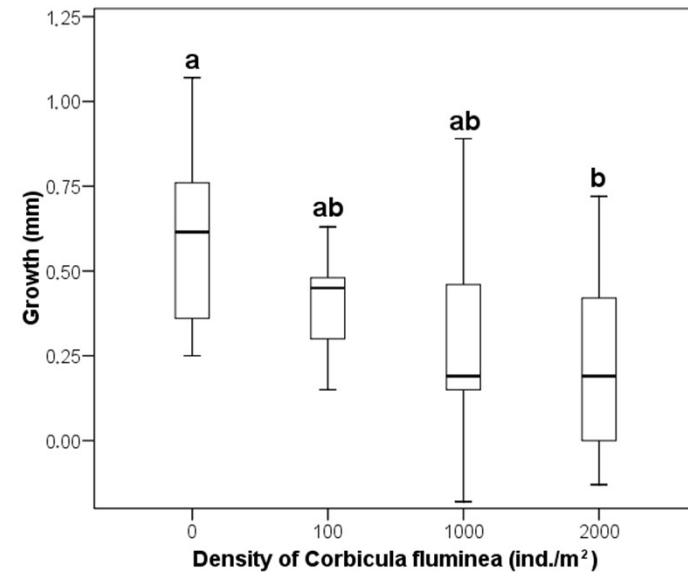
Competição por recursos e/ou espaço:

Negative effects of *Corbicula fluminea* over native freshwater mussels

Noé Ferreira-Rodríguez · Ronaldo Sousa · Isabel Pardo



Corbicula fluminea* vs. *Unio delphinus

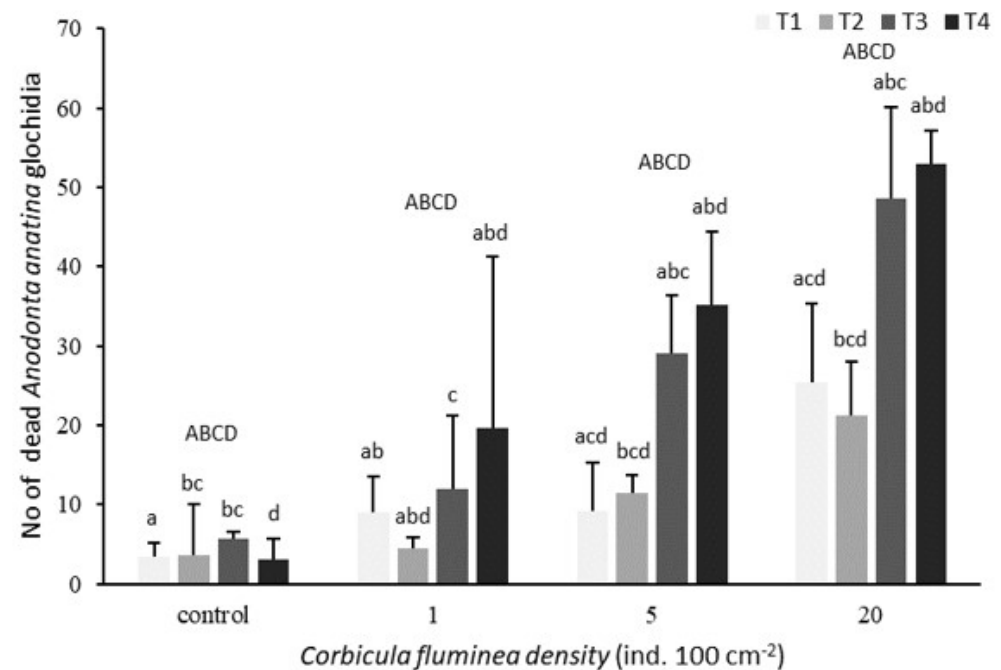
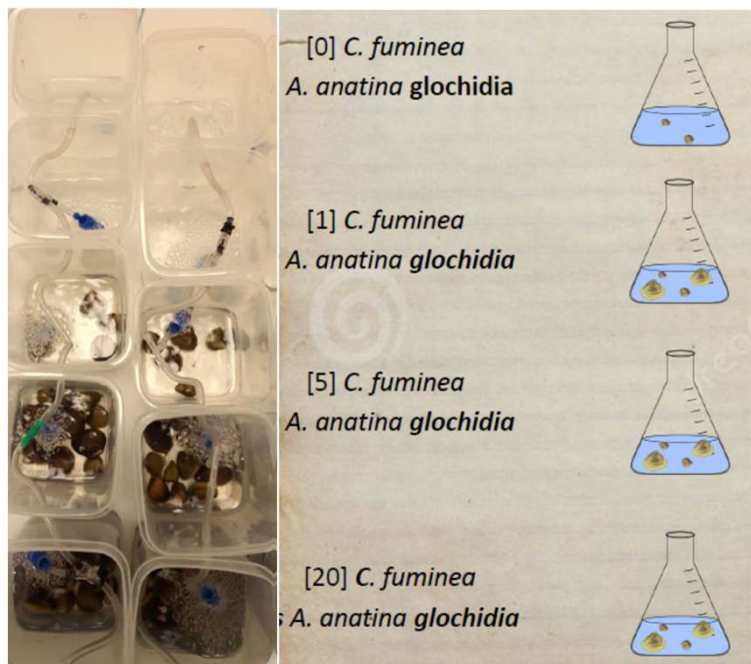


Potential impacts of the invasive species *Corbicula fluminea* on the survival of glochidia



Vanessa Modesto^{a,b,*}, Paulo Castro^a, Manuel Lopes-Lima^{b,c}, Carlos Antunes^{b,d}, Martina Ilarri^b, Ronaldo Sousa^a

Filtração de larvas de espécies nativas:

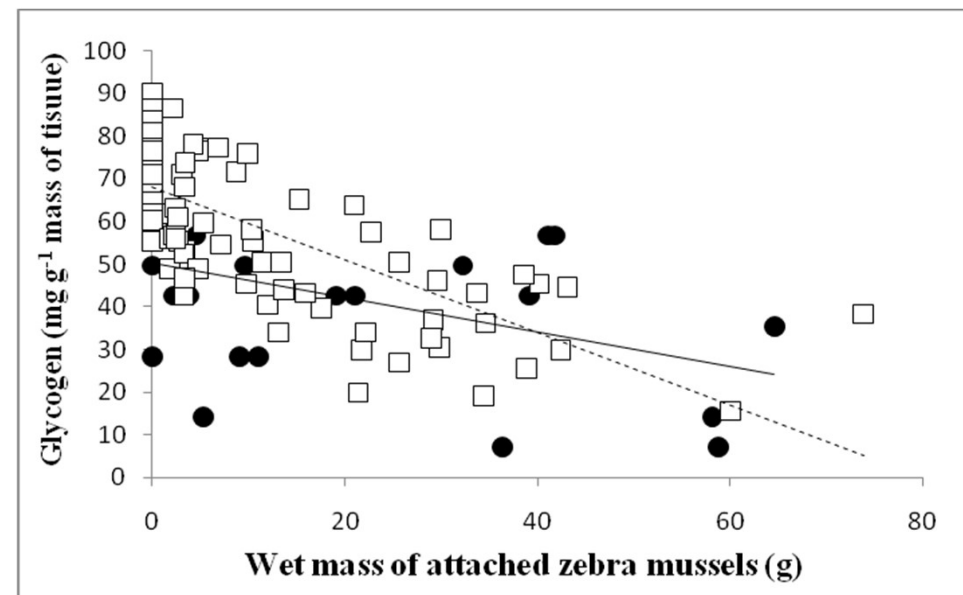
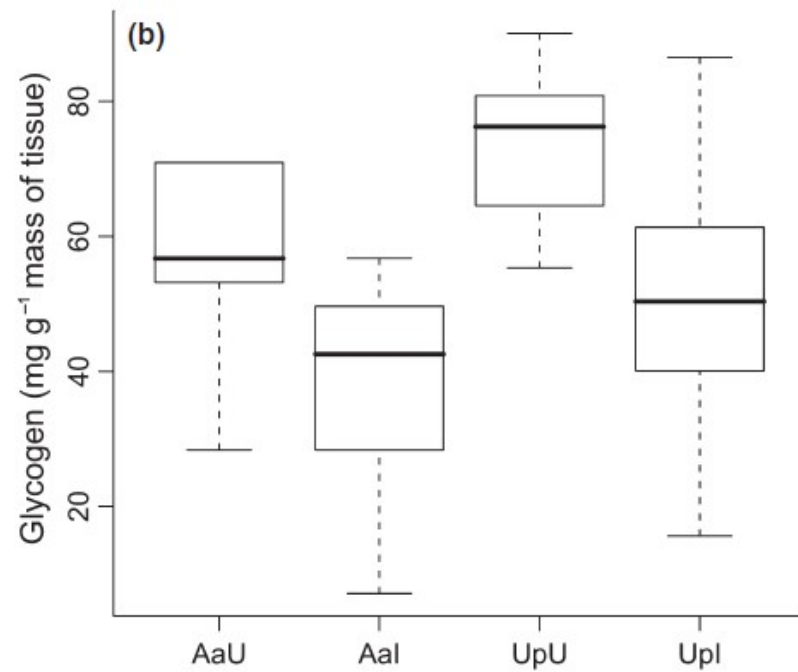


Corbicula fluminea* vs. *Anodonta anatina

T1 – 1h; T2 – 6h; T3 – 24h; T4 – 48h

Fouling of European freshwater bivalves (Unionidae) by the invasive zebra mussel (*Dreissena polymorpha*)

RONALDO SOUSA^{*,†}, FRANCESCA PILOTTO[‡] AND DAVID C. ALDRIDGE[§]



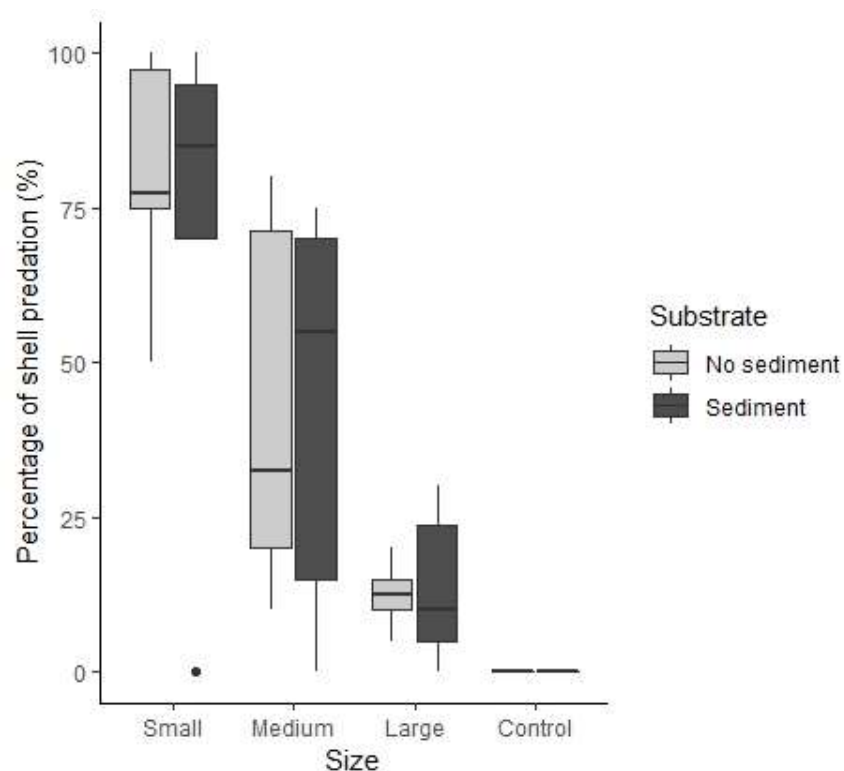
Mexilhão zebra diminui a condição fisiológica de bivalves nativos e esta situação é dependente da densidade.

A tale of shells and claws: The signal crayfish as a threat to the pearl mussel *Margaritifera margaritifera* in Europe



Ronaldo Sousa^{a,*}, Joana Garrido Nogueira^a, André Ferreira^a, Francisco Carvalho^{a,b}, Manuel Lopes-Lima^c, Simone Varandas^d, Amílcar Teixeira^e

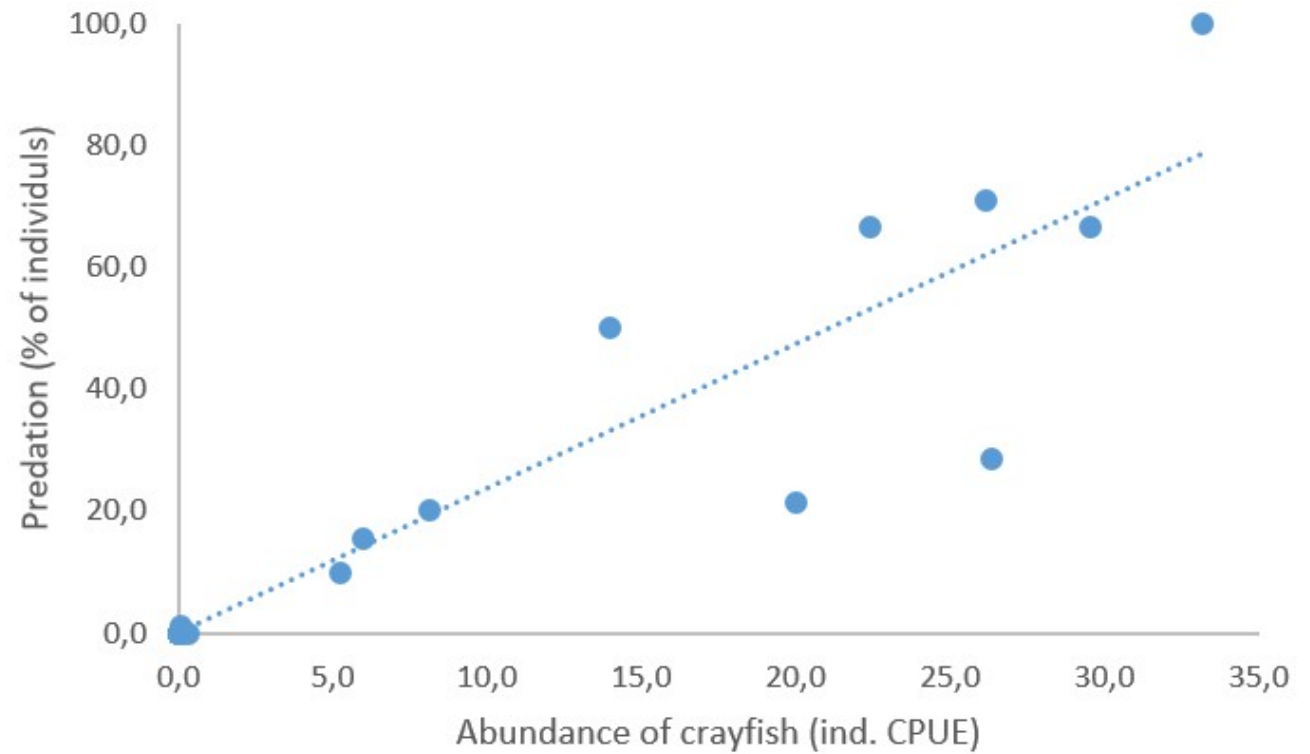
Predação de lagostim do sinal sobre *Margaritifera margaritifera*:



Tamanho ($p < 0,05$).



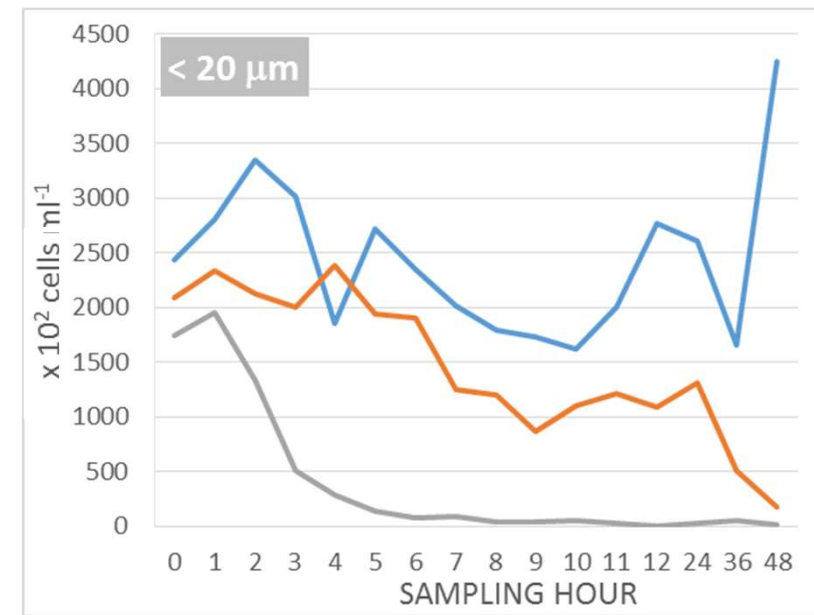
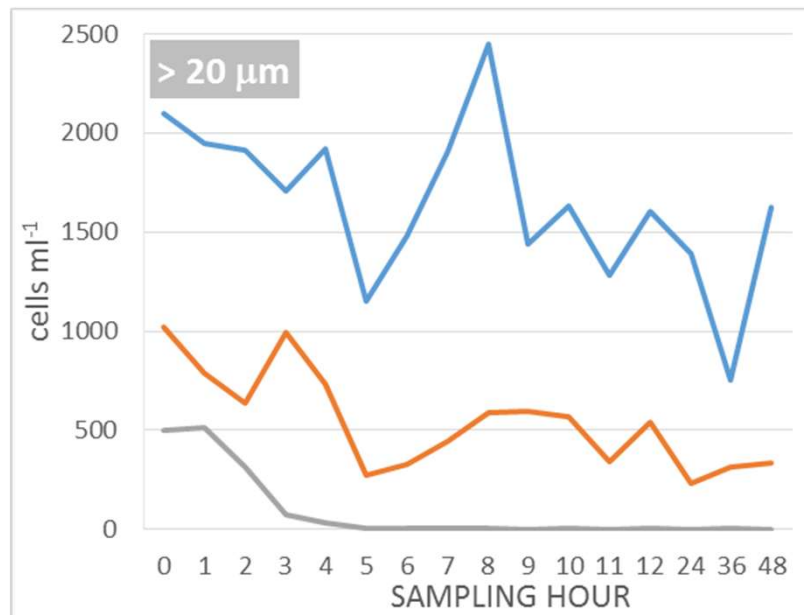
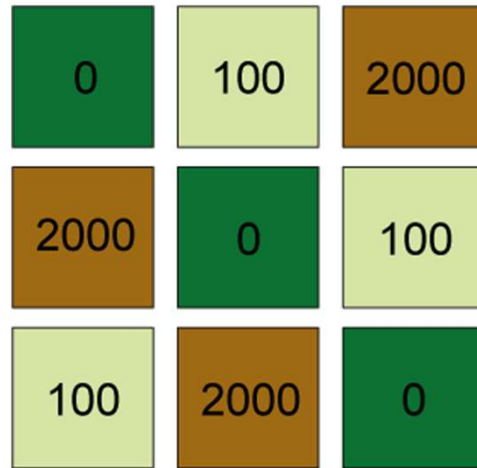
Validação no campo:



($p < 0,01$)

Nível de comunidade:

Mudanças no fitoplâncton



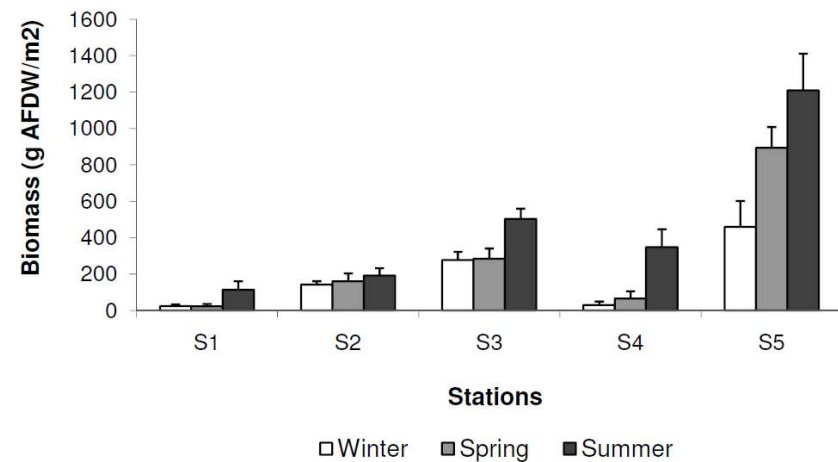
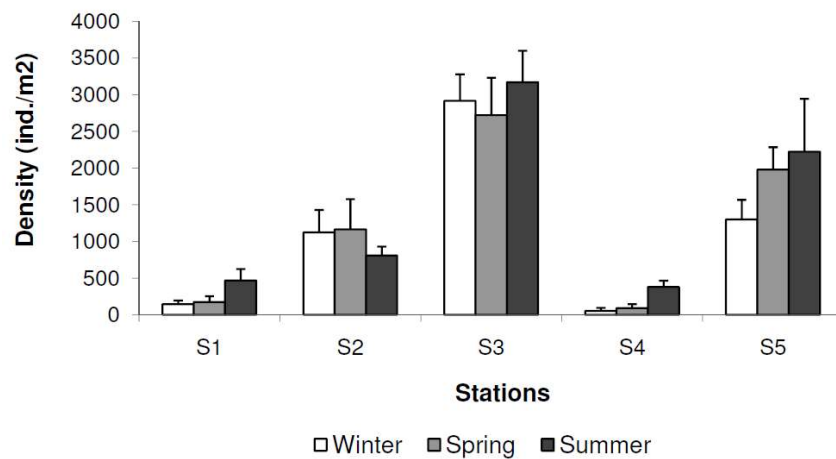
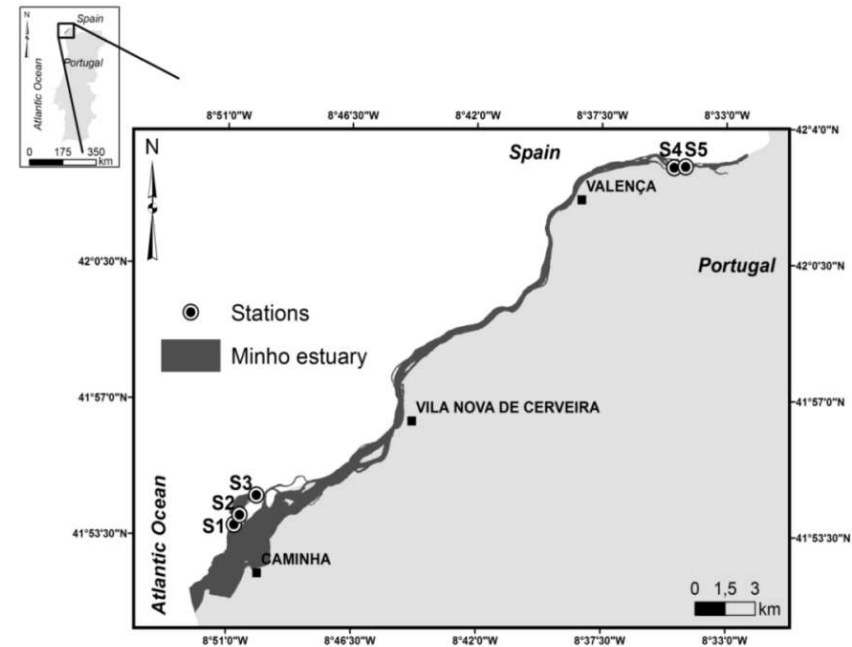
— 0 Cf m^{-2} — 100 Cf m^{-2} — 2000 Cf m^{-2}

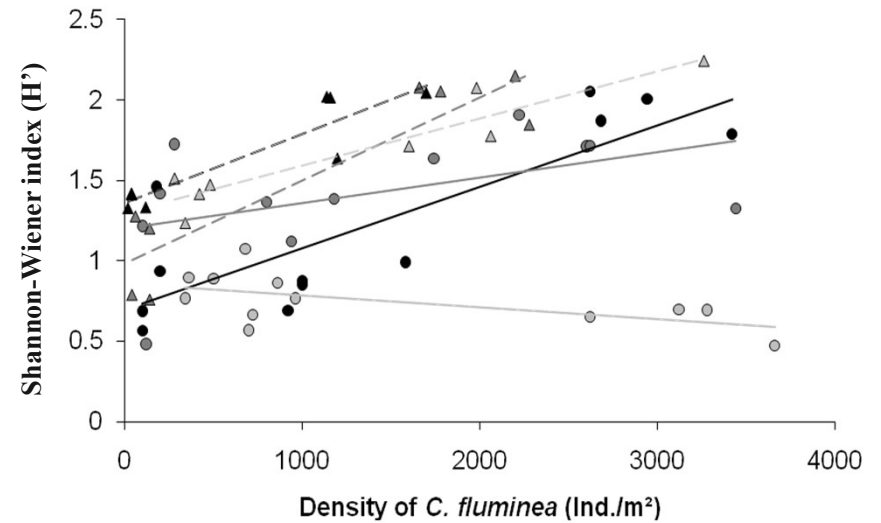
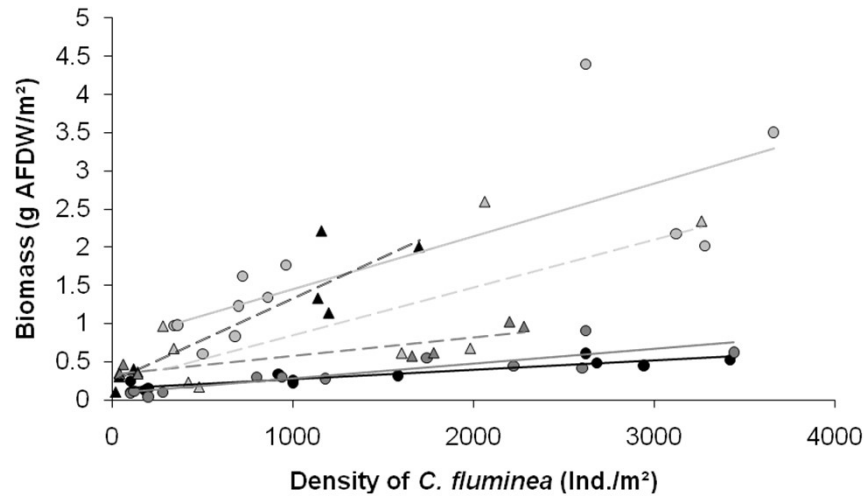
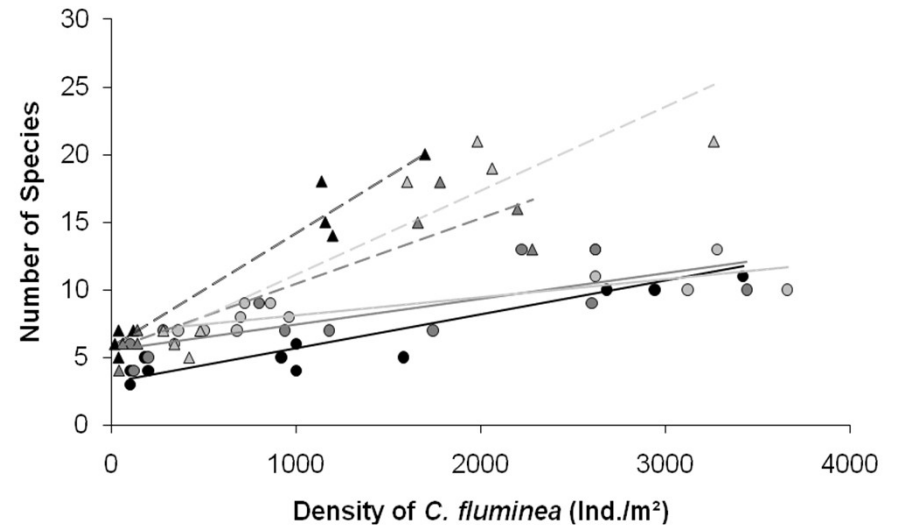
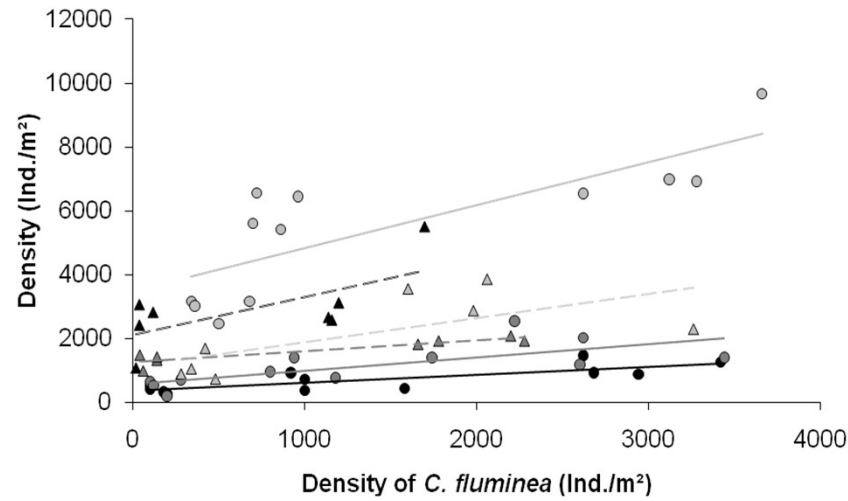
Mudanças nos macroinvertebrados:

Journal of Sea Research 72 (2012) 113–120

Associated macrozoobenthos with the invasive Asian clam *Corbicula fluminea*

Martina I. Ilarri^{a,*}, Fabiana Freitas^a, S rgia Costa-Dias^a, Carlos Antunes^{a,b},
L cia Guilhermino^{a,c}, Ronaldo Sousa^{a,d}





**Dashed lines – Freshwater;
Full Lines – Brackish;
Different colors represent
different seasons.**

MARINE ECOLOGY PROGRESS SERIES Vol. 522: 157–167, 2015

Facilitation in the low intertidal: effects of an
invasive species on the structure of an estuarine
macrozoobenthic assemblage

Adriana Novais^{1,*}, Allan T. Souza², Martina Ilarri³, Cláudia Pascoal¹, Ronaldo Sousa^{1,2}

Science of the Total Environment 566–567 (2016) 1168–1175

Effects of the invasive clam *Corbicula fluminea* (Müller, 1774) on an
estuarine microbial community

Adriana Novais^{a,*}, Allan T. Souza^b, Martina Ilarri^{c,d}, Cláudia Pascoal^a, Ronaldo Sousa^{a,c}



Control	Alive	Close	Open	Rock
Rock	Control	Alive	Close	Open
Open	Rock	Control	Alive	Close
Close	Open	Rock	Control	Alive
Alive	Close	Open	Rock	Control
Control	Alive	Close	Open	Rock



Control

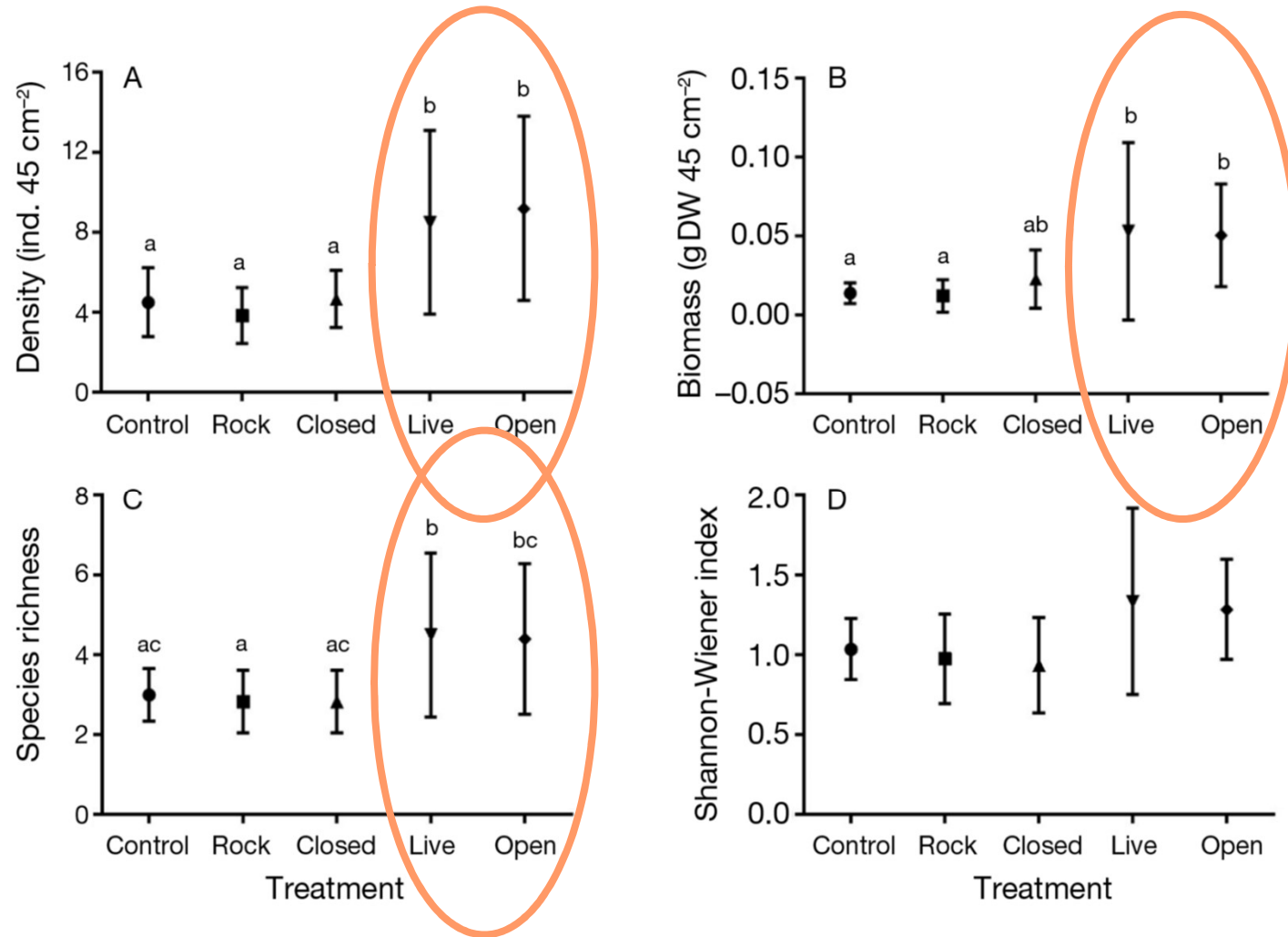
Alive

Close

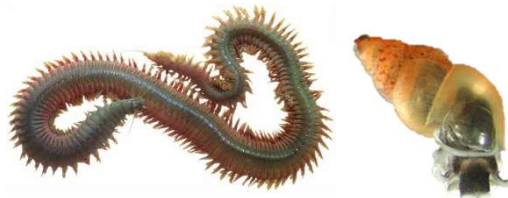
Open

Rock

Macroinvertebrados:



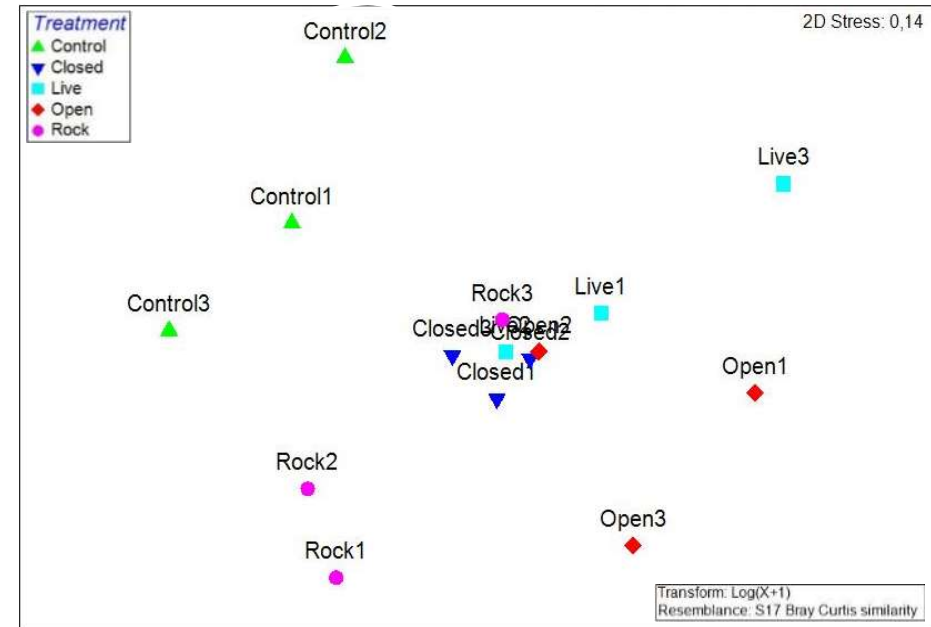
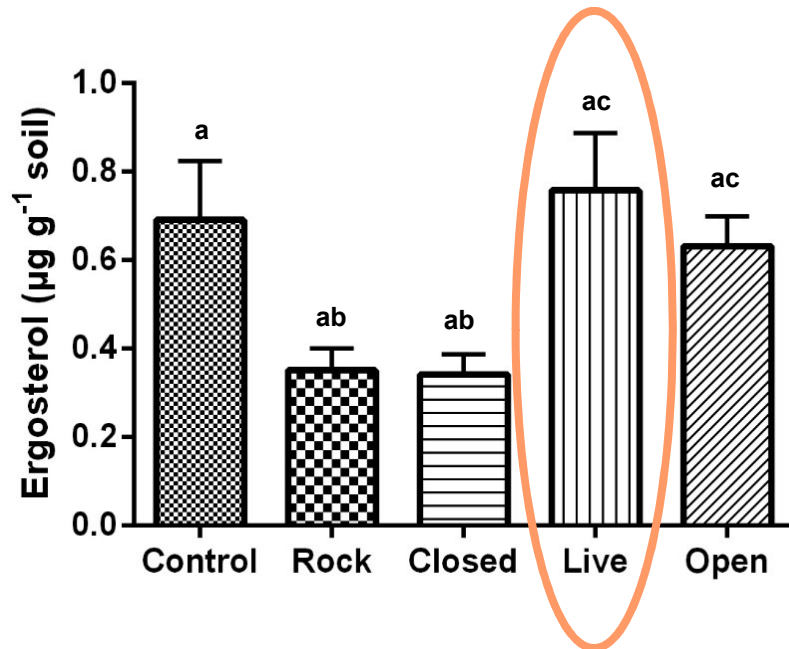
Live:



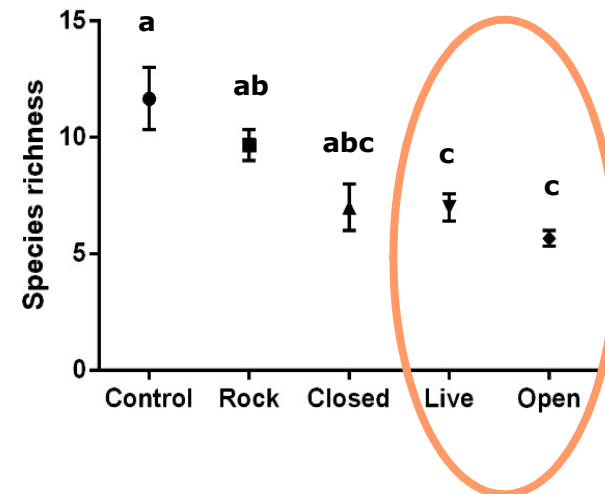
Open:



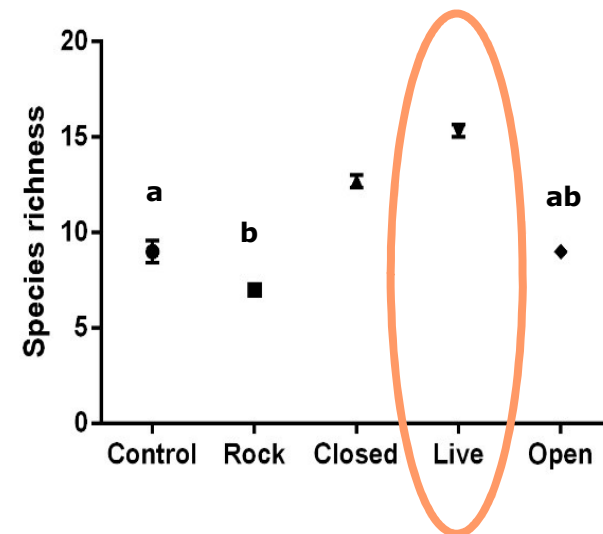
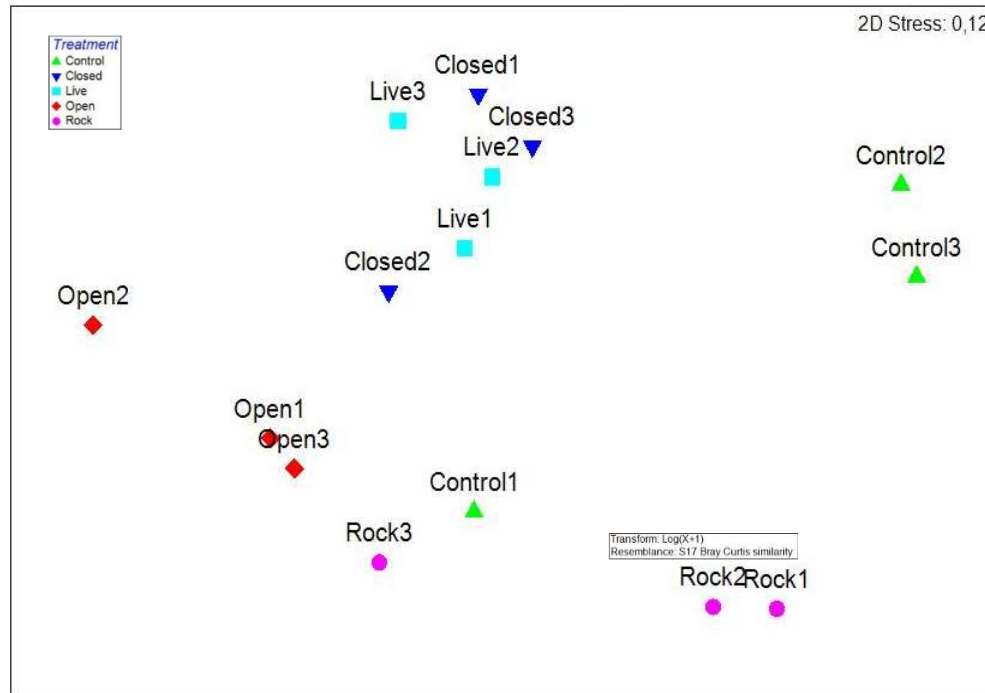
Fungos:



Maior biomassa no tratamento live, mas menor diversidade. Diferenças significativas ao nível da comunidade.



Bactérias:

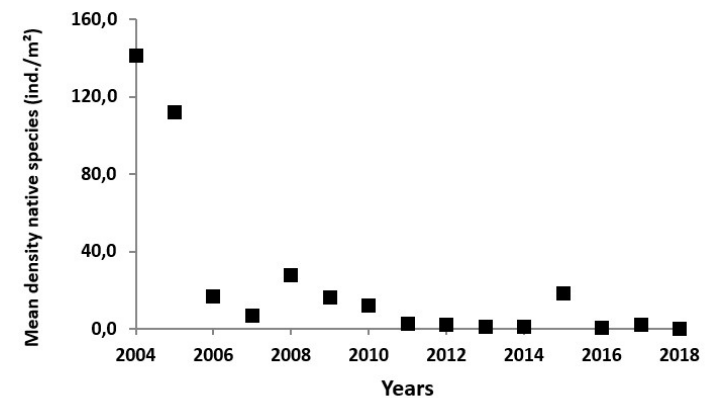
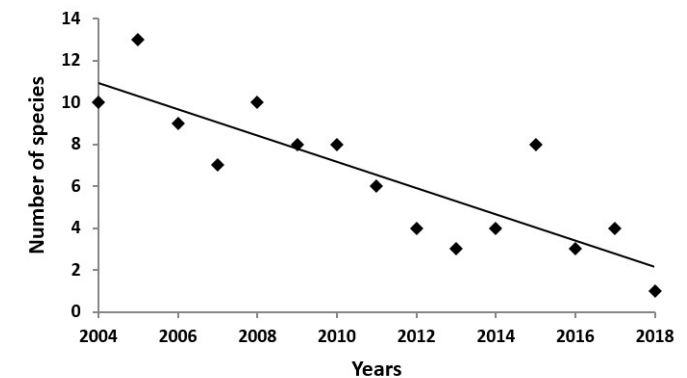
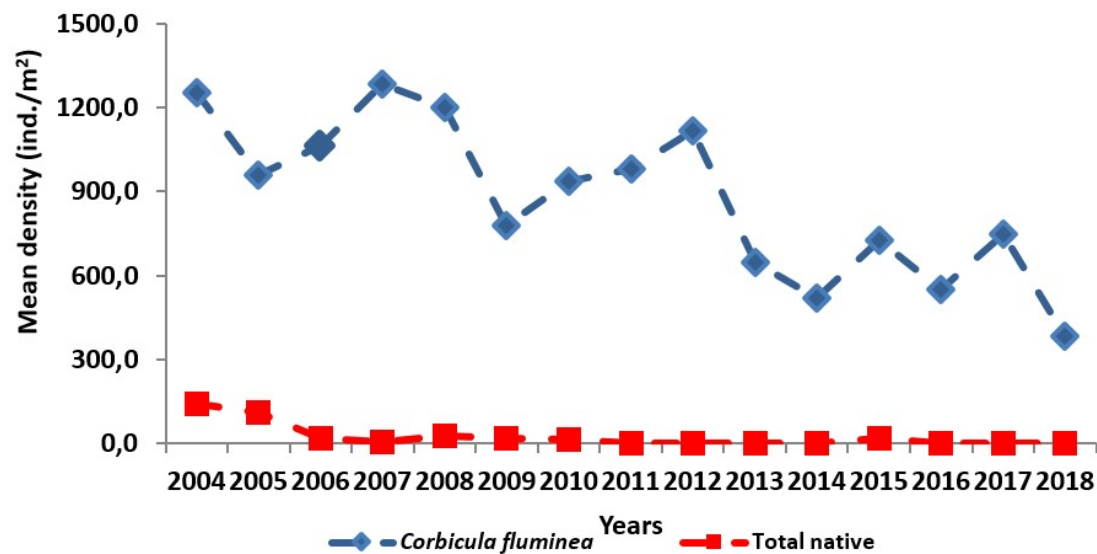
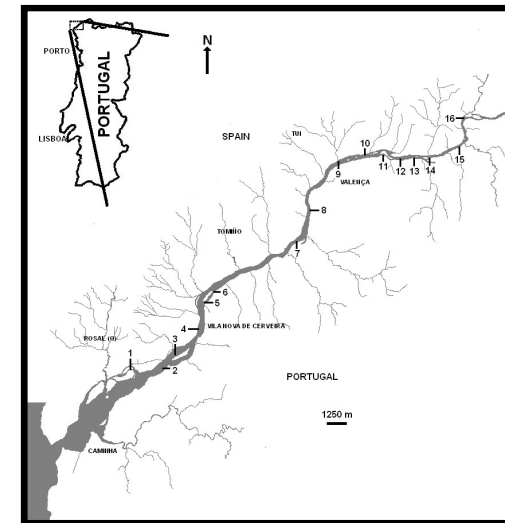


Diferenças significativas ao nível da comunidade e riqueza maior no tratamento live.

Massive mortality of the Asian clam *Corbicula fluminea* in a highly invaded area

Martina I. Ilarri · Carlos Antunes ·
Lúcia Guilhermino · Ronaldo Sousa

***Corbicula fluminea* (Rio Minho):**
Amostragens em Outubro 2004 a 2018
16 locais $\approx$ 30 km



AQUATIC BIOLOGY

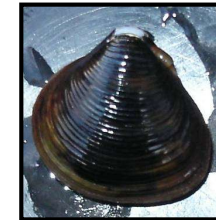
Minho River tidal freshwater wetlands: threats to faunal biodiversity

Ronaldo Sousa^{1,2,*}, Sérgia Costa Dias^{1,2}, Lúcia Guilhermino^{1,2}, Carlos Antunes^{1,3}

Passado

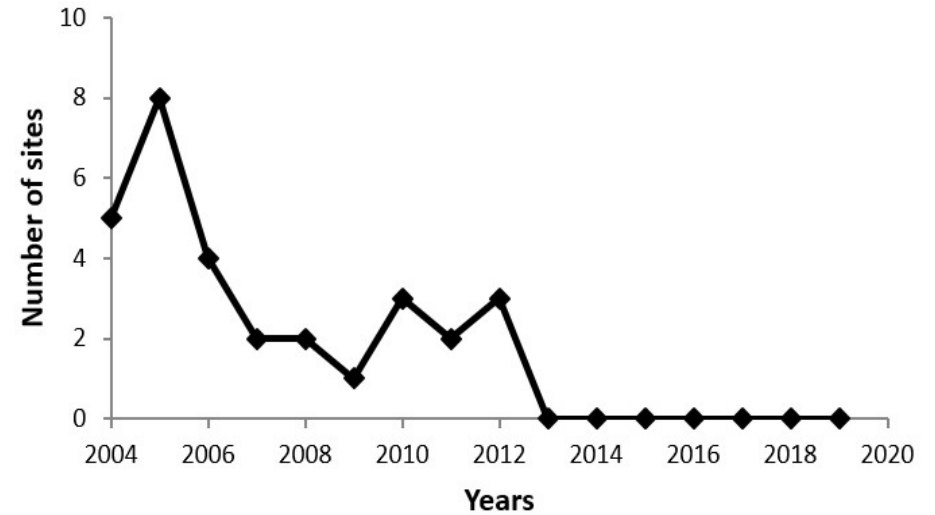
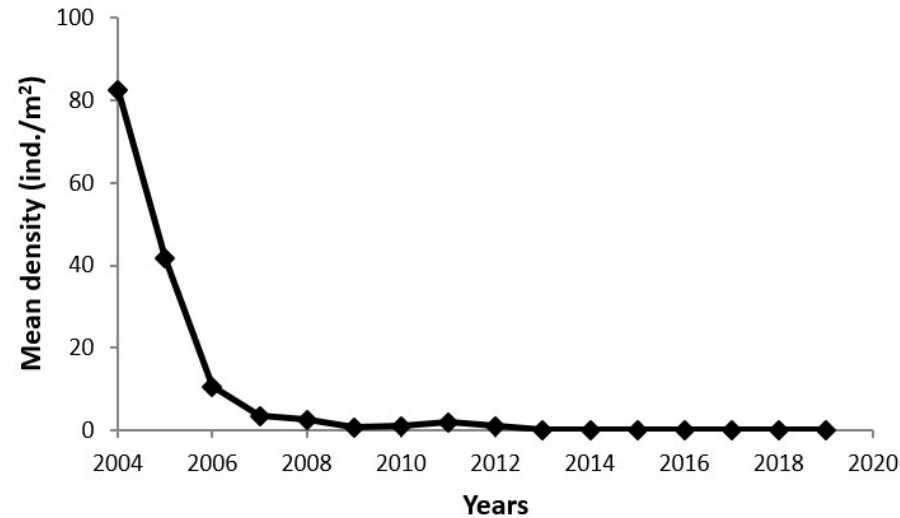


Presente





***Pisidium amnicum* (espécie nativa):** **Se um declínio desta magnitude**



Fosse descrito para...



Nível Ecossistema:



Corbicula fluminea

Rio Minho:

2 280 ind. m⁻²

10 225 g m⁻²



Science of the Total Environment 538 (2015) 664–671

From water to land: How an invasive clam may function as a resource pulse to terrestrial invertebrates

Adriana Novais ^{a,b,*}, Allan T. Souza ^b, Martina Ilarri ^{b,c}, Cláudia Pascoal ^a, Ronaldo Sousa ^{a,b}

Biol Invasions (2017) 19:2491–2502

Effects of invasive aquatic carrion on soil chemistry and terrestrial microbial communities

Adriana Novais • Cláudia Pascoal • Ronaldo Sousa



0	100	500	1000	2000
2000	0	100	500	1000
1000	2000	0	100	500
500	1000	2000	0	100
100	500	1000	2000	0
0	100	500	1000	2000
2000	0	100	500	1000
1000	2000	0	100	500

Nutrientes

Fungos

Bactérias

Diptera e macroinvertebrados

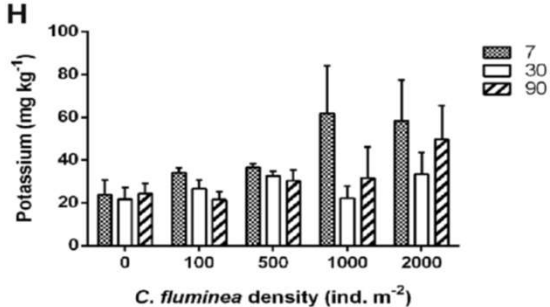
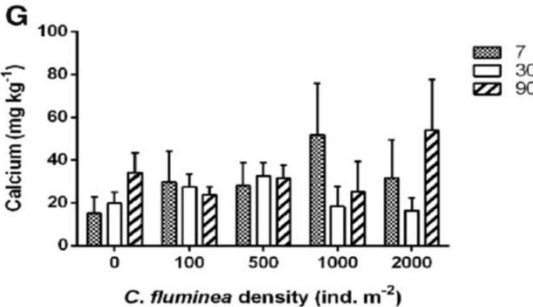
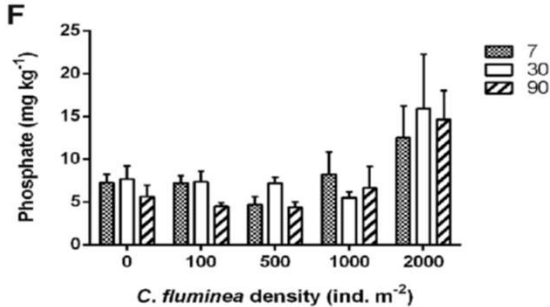
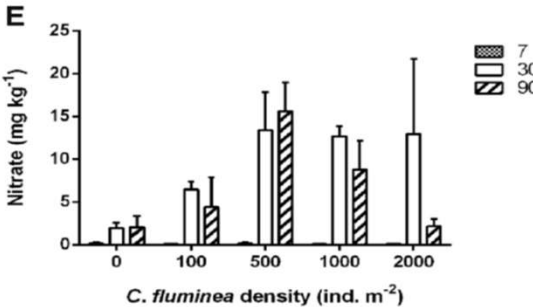
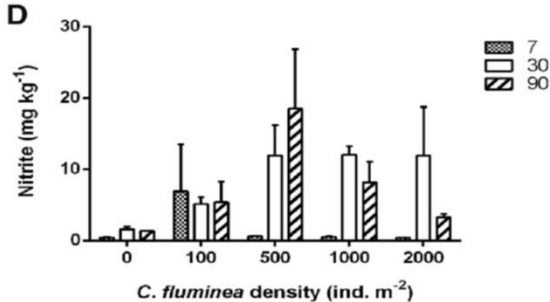
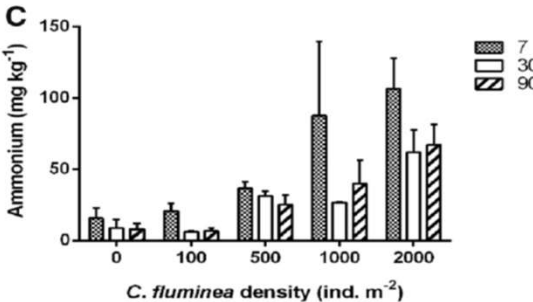
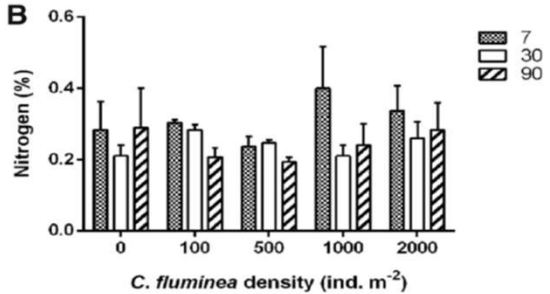
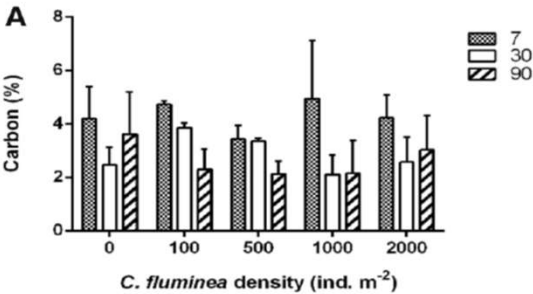
Sedimento

Census and pitfall traps



Amostragem: 7, 30 e 90 Dias; início final de Maio.

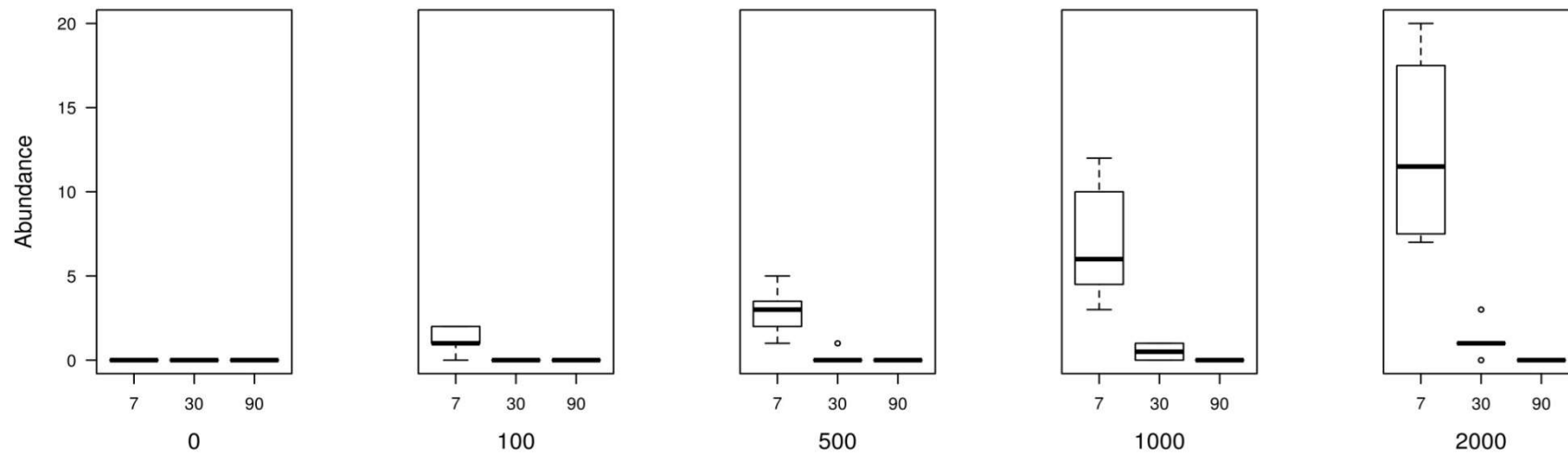
Nutrientes:



Diptera:



N

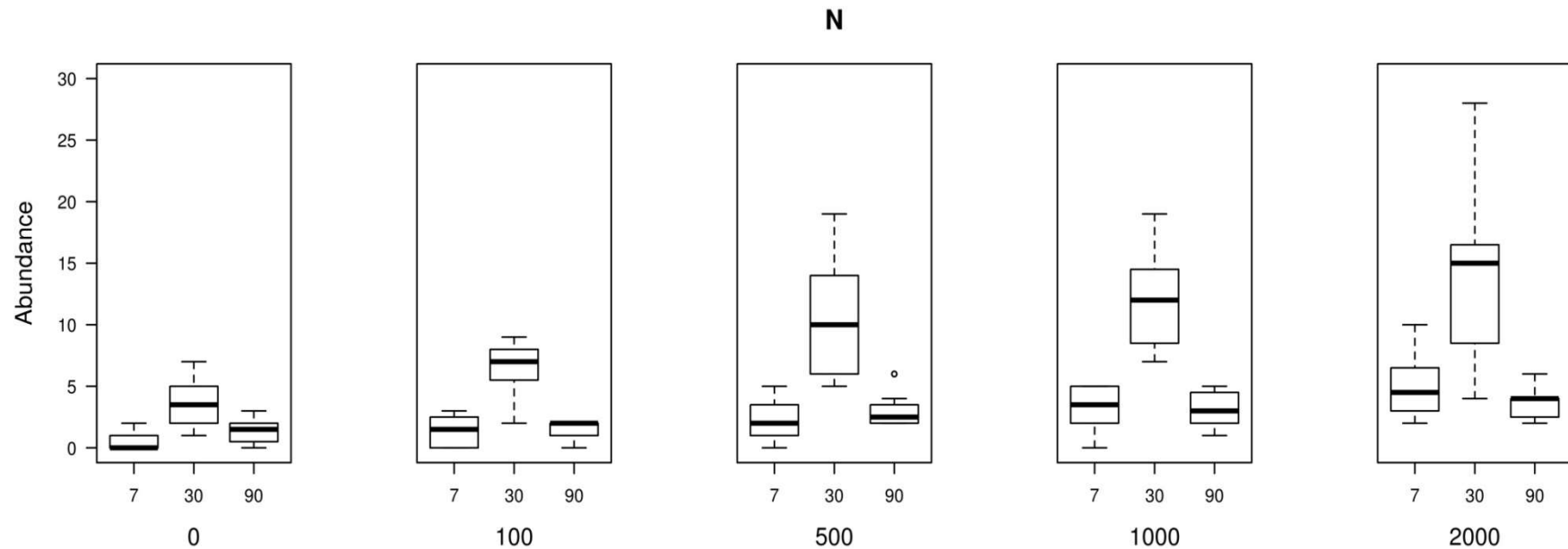


Density, Time, Density X Time
 $p = 0.0001$

Macroinvertebrados Terrestres:



75 taxa diferentes



**Density, Time $p = 0.0001$
Density X Time $p = 0.0008$**

Fungos e bactérias:

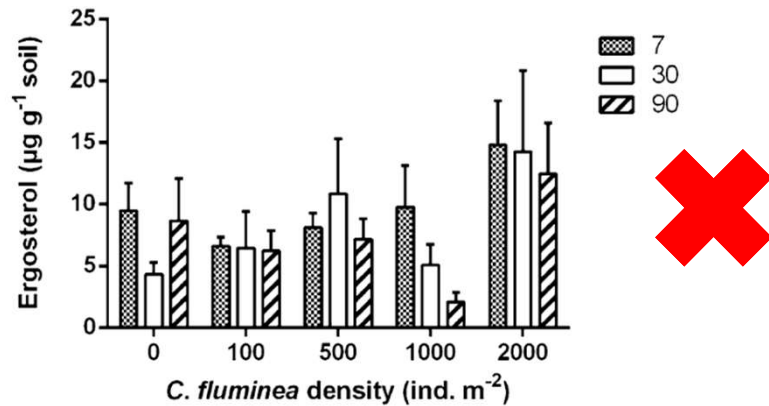


Fig. 2 Mean ($\pm$ SEM) values of ergosterol concentration ($\mu\text{g g}^{-1}$ soil) at different densities of *C. fluminea* (0, 100, 500, 1000 and 2000 ind. m^{-2}) and sampling times (7, 30 and 90 days)

Sem diferenças na biomassa de fungos, mas diferenças significativas nas comunidades de fungos e bactérias.

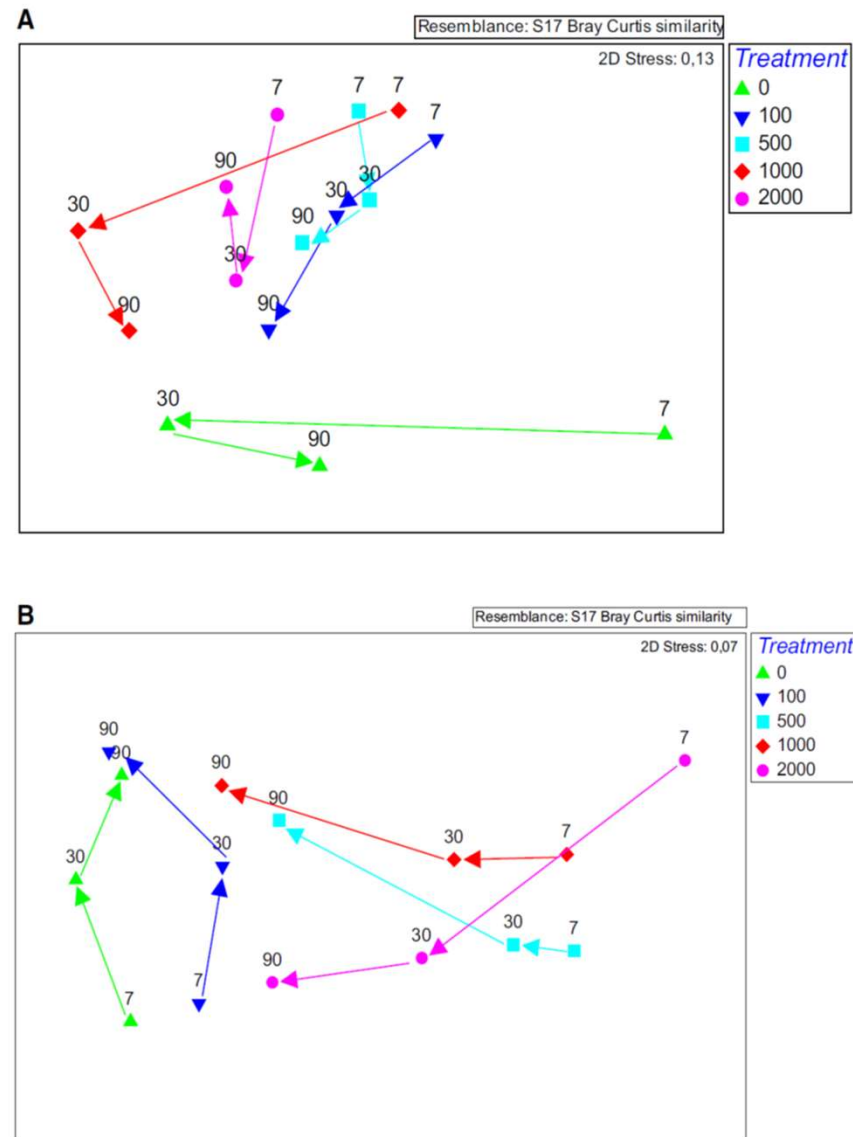


Fig. 3 Non-metric multidimensional scaling (NMDS) plot of fungal (a) and bacterial (b) community at different densities of *C. fluminea* (0, 100, 500, 1000 and 2000 ind. m^{-2}) and sampling times (7, 30 and 90 days)

Conclusão

