

A baseline for a monitoring program in the Natural Local Reserve of Douro Estuary using the AMBI index

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7º Simpósio sobre a Margem Ibérica Atlântica - MIA12

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Intro

- Contract between the Municipality of Vila Nova de Gaia and the Faculty of Sciences, University of Porto entitled "Study and monitoring of vertebrates and invertebrates of Natural Local Reserve of Douro estuary"
- The conservation and operation of RNLED must be based on scientific knowledge about the functioning of the ecosystem.



Natural Local Reserve of Douro Estuary

- Created in 2008 54ha of protected area
- Main objective of the reserve shelter and feeding area for migratory birds, some of them a priority for conservation under the EU Birds Directive (79/409/EEC)



Aims

- Use the benthic community of RNLED to access the ecological quality of this system, with the application the AMBI index
- Establish a baseline for future monitoring programs in the reserve
- Create scientific knowledge to support conservation and management of the reserve

Methods

Fieldwork

- 11 sampling stations (3 sandy shore; 1 salt-marsh; 7 mud/sand estuarine zone)
- 12 sampling months (June 2010 May 2011)
- Collect the superficial sediment layer using a core sampler (10cm diameter)
- Samples fixed and stained with 4% formalin + Rose Bengal





Laboratory

• Identification and counting of invertebrates

AZTI Marine Biotic Index (AMBI)

Borja et al. (2000)

- Designed for the study of benthic macroinvertebrate communities, assessing the ecological quality in coastal environments;
- Software that includes more than 6500 taxa (last updated May 2012);
- Assign to each species a particular Ecological Group (EG) according to a gradient of sensitivity to disturbances;
- Calculates the biotic index and graphically represents all data;
- Proposes a classification of level of disturbance of a coastal ecosystem by the representation of health of benthic macroinvertebrate community;





Tubificidae 39529 ind.

Index	Mean value
Shannon-Wienner Diversity	0.598
Eequitability of Pielou	0.473

Hediste diversicolor 55,502 g



Assignment of ecological groups



• Ecological group V (opportunistic species and less sensitive to disturbances) was the most abundant in all sampling sites and in all months (>65%)

• Due to high percentage of TUBIFICIDAE

• *Taxa* "not assigned" (<3,6%) lower than (20%) recommended by Borja et al. (2004)

AMBI Biotic Index



azti



- AMBI index range between 4 6
- Due to high percentage of *taxa* of Ecological Group V
- AMBI index Indicates a system "Moderately disturbed" to "Heavily disturbed"



Spatialization of AMBI values – Application of GIS tools



Conclusions

- AMBI index classified the protected area as "Moderately disturbed" to "Heavily disturbed"
- The value of Shannon diversity index (0.598) is lower than the value previously recorded in Douro estuary (0.734) (Mucha et al. 2004)
- We established a baseline for future studies and monitoring programs on the evolution of this reserve and on the evaluation of its management for conservation



Thanks for Your Attention



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