

Rastreabilidade e certificação dos produtos da pesca e da aquicultura

Do RASTREMAR ao CITAQUA

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universidade
de aveiro



Seminário de divulgação de projetos da UNIVERSIDADE DE AVEIRO
apoiados pelo **Mar 2020** | 30 SETEMBRO 2022 | ÍLHAVO ECOMARE



INVESTIGAÇÃO APLICADA À BIOECONOMIA DO MAR



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Utilização de ferramentas moleculares na rastreabilidade de produtos alimentares de origem marinha

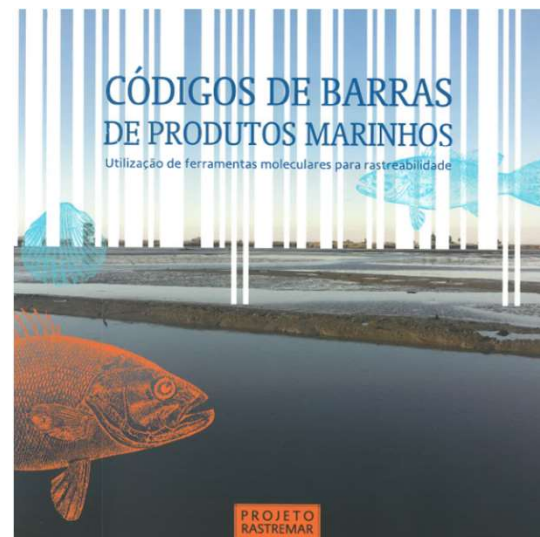
PROMAR 31-03-05-FEP-0015

2011-05-01 - 2014-12-31 (44 Meses)

Financiamento Total - 346.799 €

Instituição Proponente:
Universidade de Aveiro

Instituições Participantes:
Aguacircia - Piscicultura Lda.
AquaRia - Piscicultura Lda.
Materaqua - Criação e Comercialização de Peixes, Lda
Associação dos Produtores de Bivalves da Ria de Aveiro

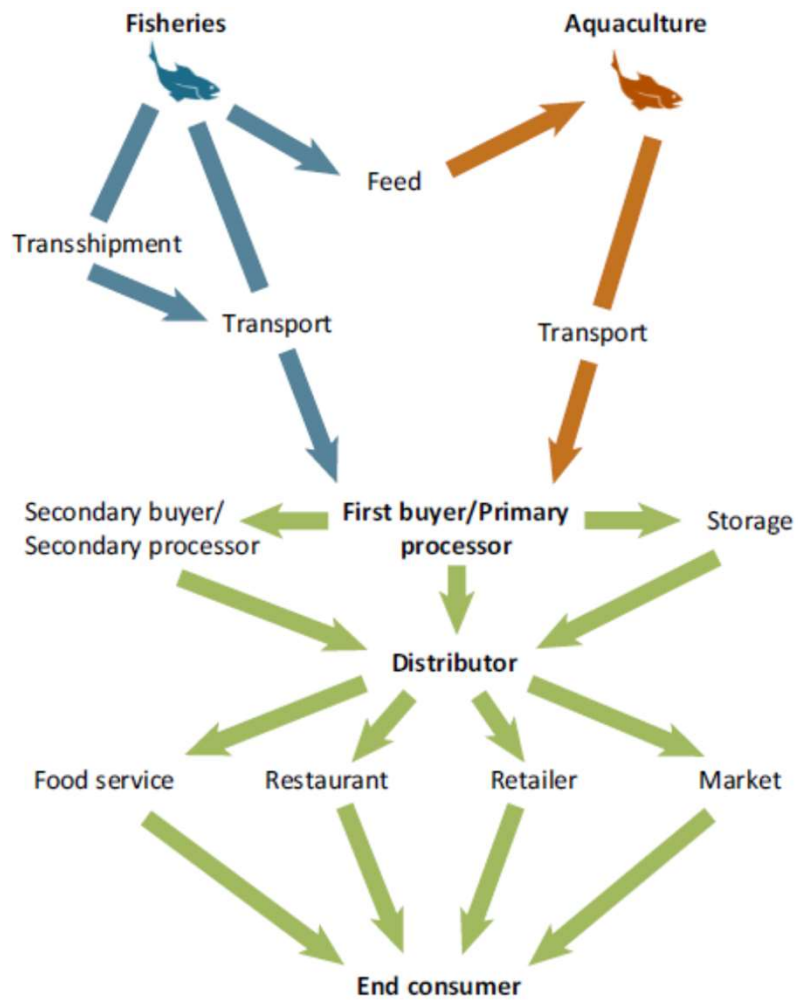


promar
Programa Operacional Pesca 2007 - 2013

UNIÃO EUROPEIA
Fundo Europeu
das Pescas

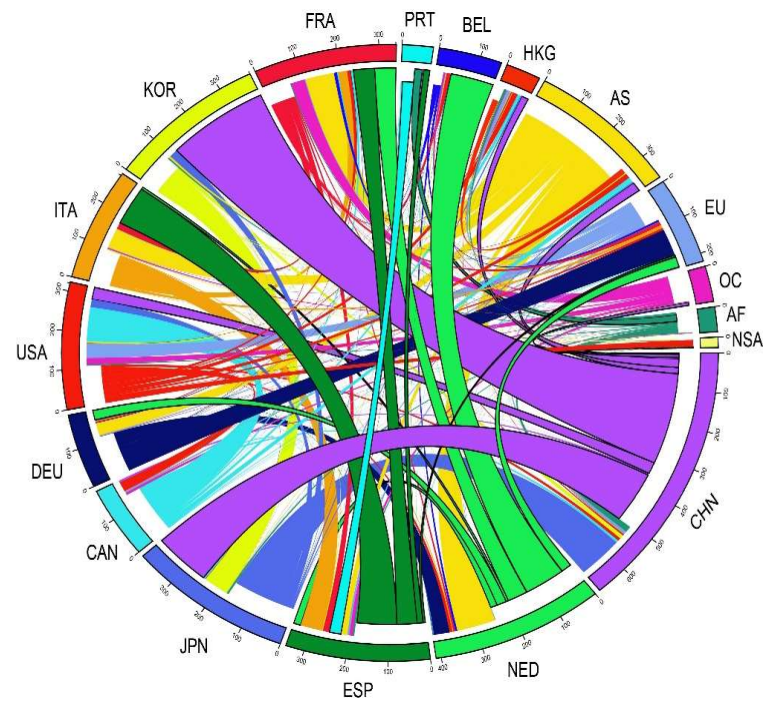
GOVERNO DE PORTUGAL
MINISTÉRIO DA AGRICULTURA,
DO MAR, DO AMBIENTE
E DO ORDENAMENTO DO TERRITÓRIO

RASTREMAR



Seafood traceability: current needs, available tools, and biotechnological challenges for origin certification

Miguel Costa Leal¹, Tânia Pimentel¹, Fernando Ricardo¹, Rui Rosa², and Ricardo Calado¹





Robalo

Dicentrarchus labrax

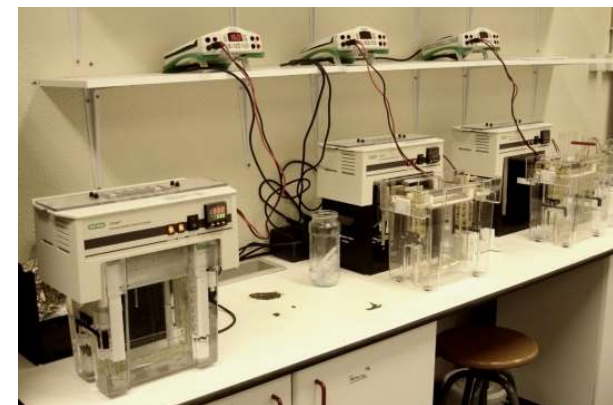
Espécie aquícola importante produzida em tanques de terra na Ria de Aveiro em regime de aquacultura semi-intensiva



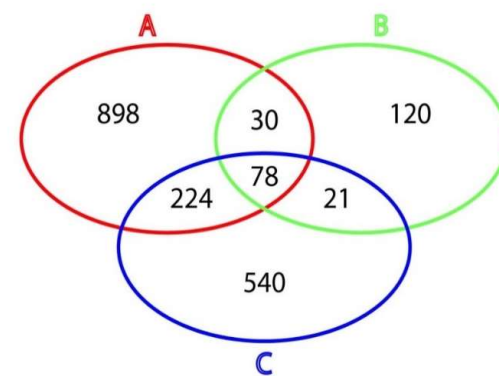
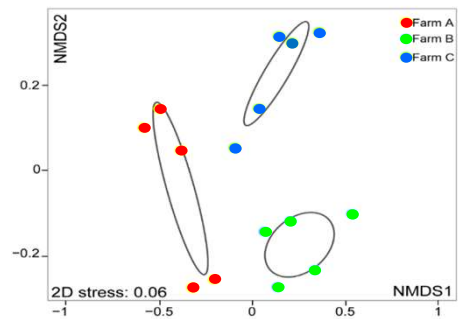
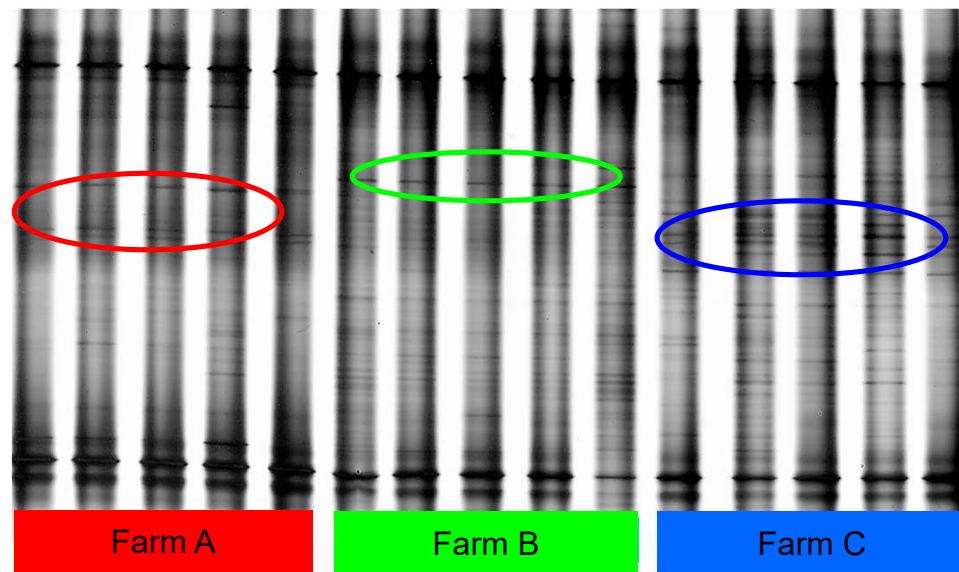
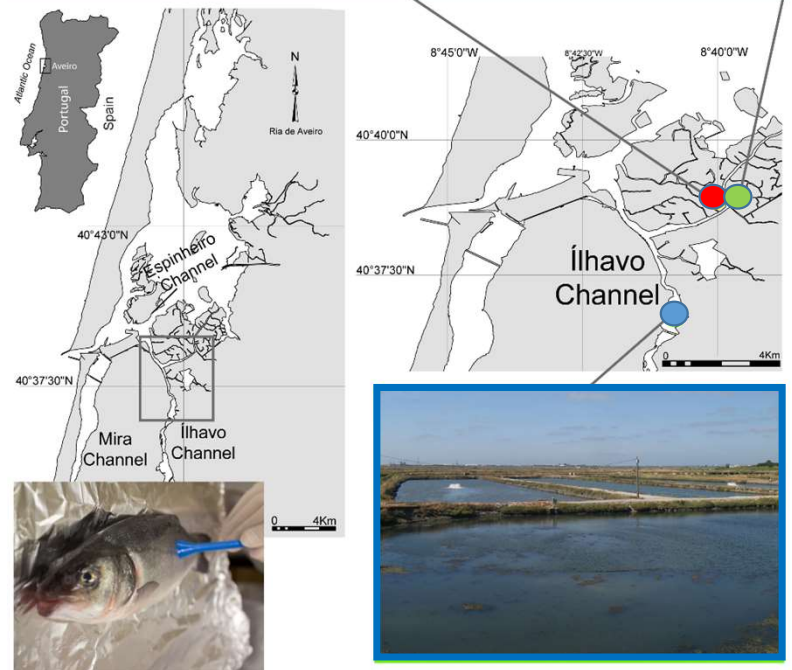
Berbigão

Cerastoderma edule

Bivalve com maior relevância socioeconómica na Ria de Aveiro, sendo capturado em diferentes zonas de produção de bivalves (RIAVs) existentes nesta laguna costeira



Análises metagenómicas do microbioma do muco de robalo



SCIENTIFIC REPORTS

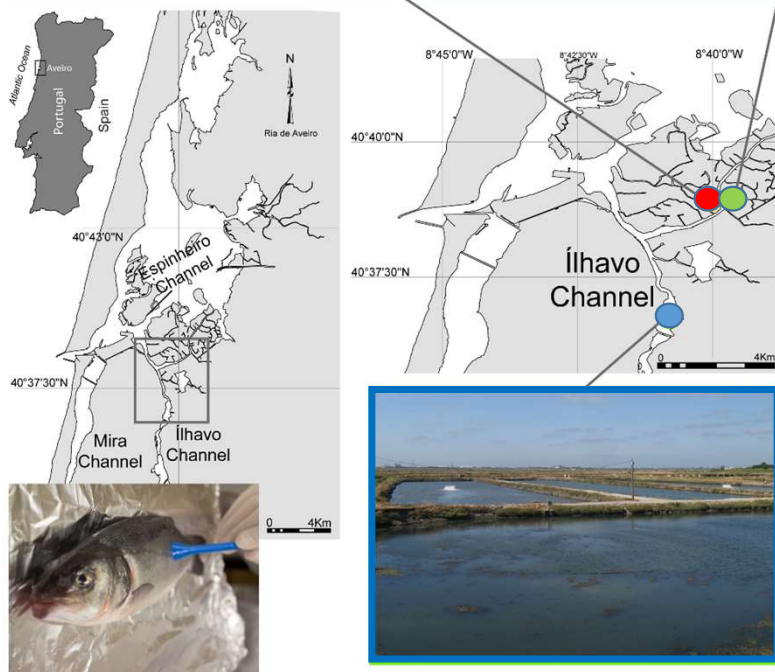
OPEN **Bacterial communities 16S rDNA fingerprinting as a potential tracing tool for cultured seabass *Dicentrarchus labrax***

Received: 11 May 2017

Accepted: 25 August 2017

Published online: 19 September 2017

Tânia Pimentel¹, Joana Marcelino², Fernando Ricardo¹, Amadeu M. V. M. Soares¹ & Ricardo Calado¹

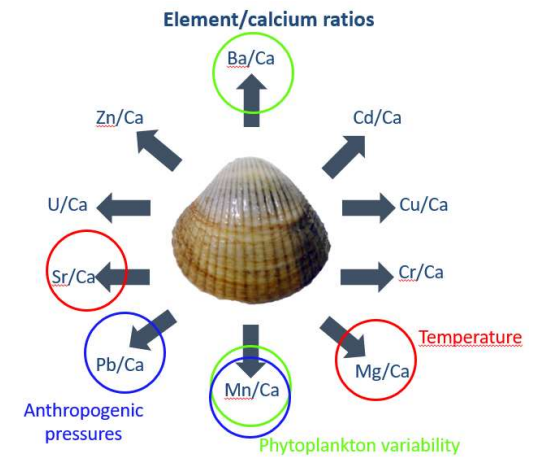
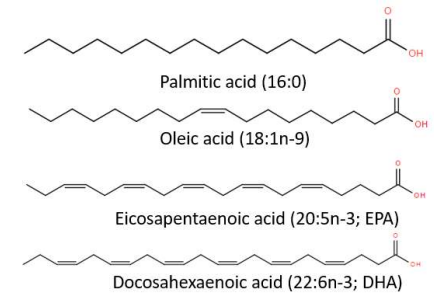
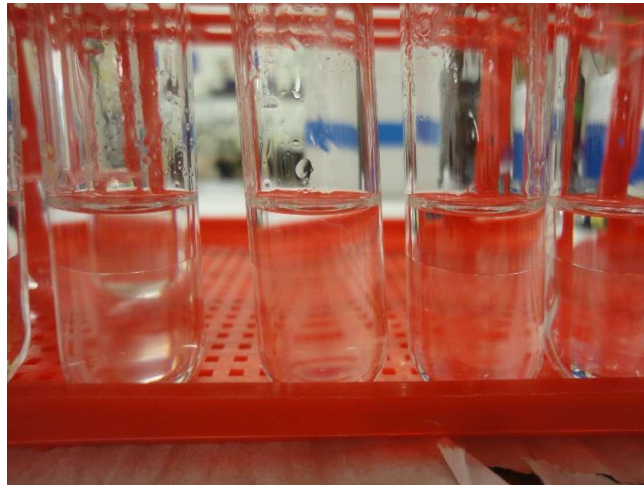




Análise do perfil de ácidos gordos do músculo adutor (GC-MS)



Análise da composição elementar da concha (ICP-MS)



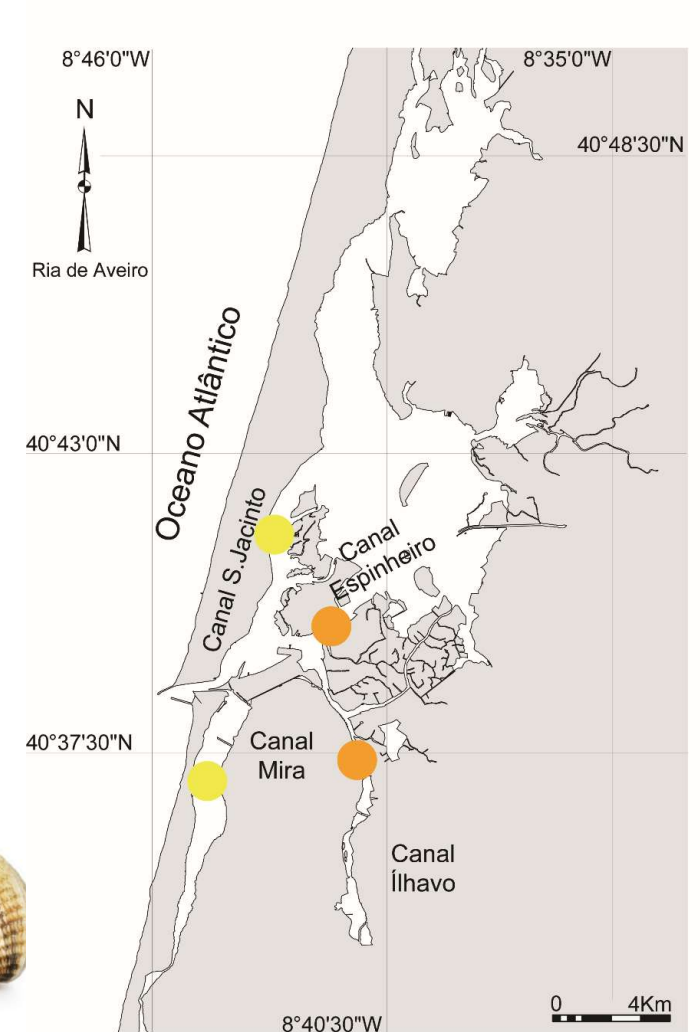


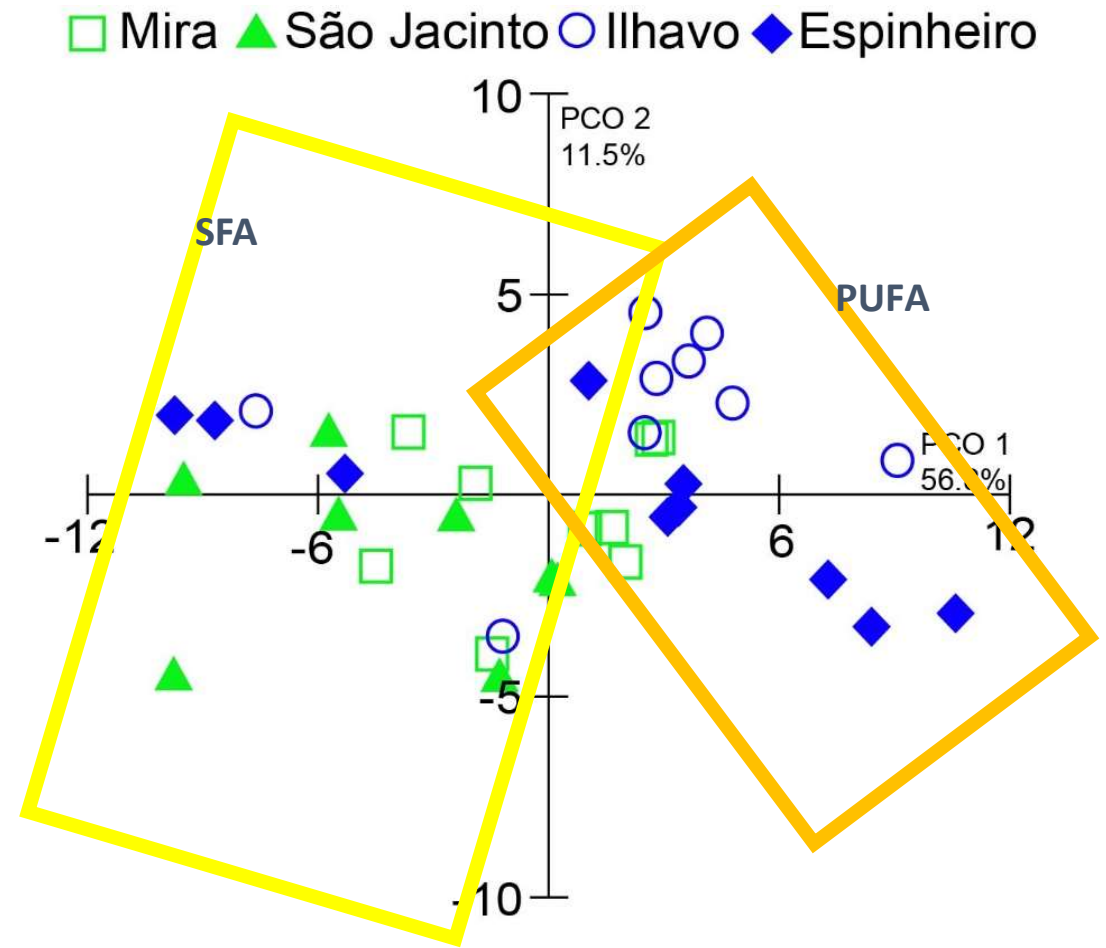
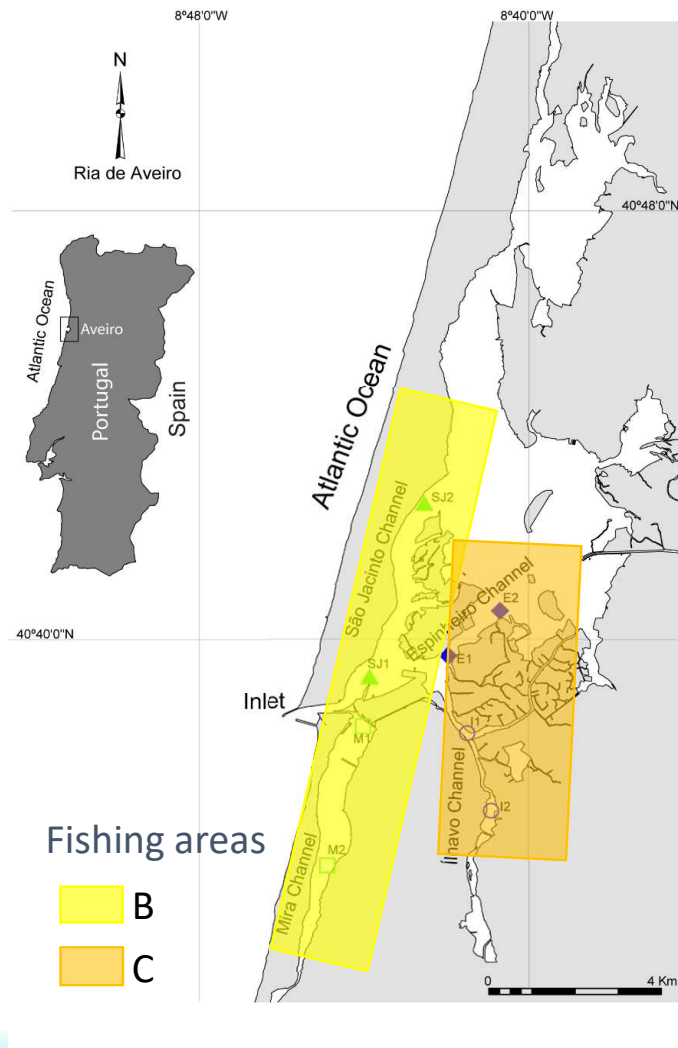
(A) ≤ 230 *E. coli* /100 g de carne e líquido intravalvar

(B) $230 < E. coli \leq 4600$ /100 g de carne e líquido intravalvar em 90% das amostras

(C) $4600 < E. coli \leq 46000$ /100 g de carne e líquido intravalvar

(D) > 46000 *E. coli* /100 g de carne e líquido intravalvar





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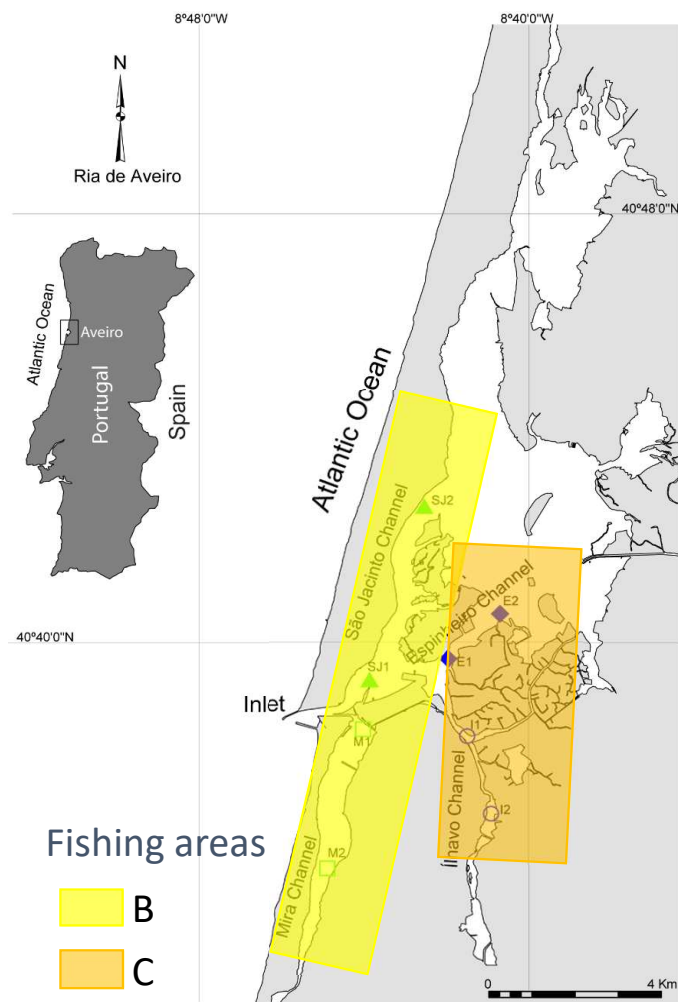
OPEN Potential use of fatty acid profiles of the adductor muscle of cockles (*Cerastoderma edule*) for traceability of collection site

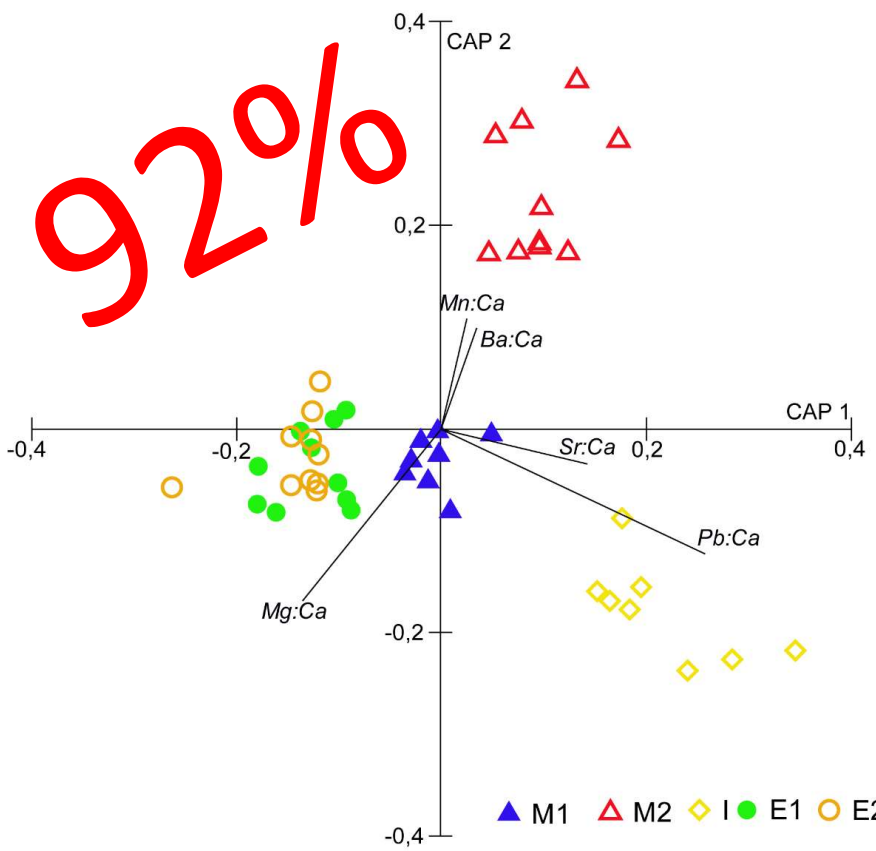
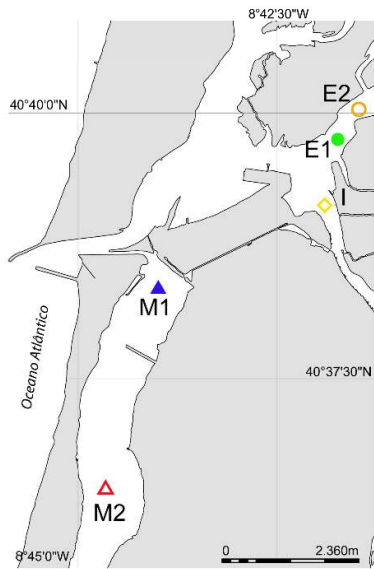
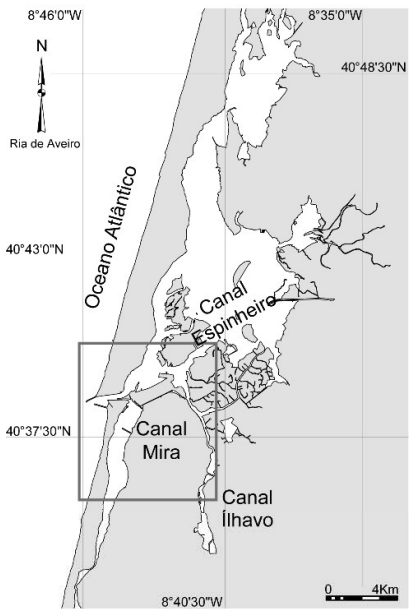
Received: 02 February 2015

Accepted: 05 May 2015

Published: 18 June 2015

Fernando Ricardo¹, Tânia Pimentel¹, Ana S.P. Moreira², Felisa Rey³, Manuel A. Coimbra², M. Rosário Domingues², Pedro Domingues², Miguel Costa Leal¹ & Ricardo Calado¹





$p=0.268$

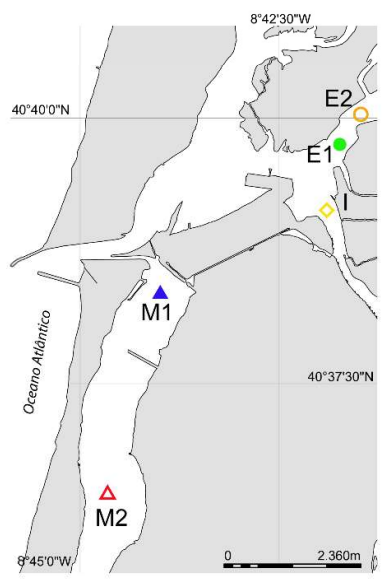
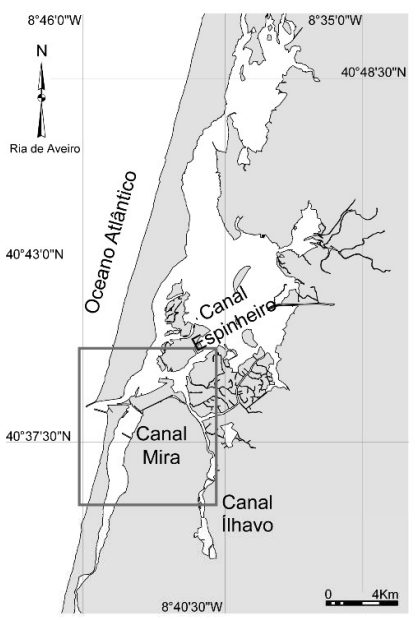


SCIENTIFIC REPORTS

OPEN Trace element fingerprinting of cockle (*Cerastoderma edule*) shells can reveal harvesting location in adjacent areas

Received: 22 December 2014
Accepted: 27 May 2015
Published: 07 July 2015

Fernando Ricardo¹, Luciana Génio², Miguel Costa Leal¹, Rui Albuquerque², Henrique Queiroga², Rui Rosa² & Ricardo Calado²



CISION

ID: 73988253

Jornal de Notícias

11-03-2018

Méio: Imprensa

País: Portugal

Período: Diária

Âmbito: Informação Geral



Aveiro Projeto da universidade permite detetar origem geográfica de amêijoas e berbigão

Bivalves com bilhete de identidade

Investigadores Ricardo Calado, Fernando Ricardo e Patrício Domingues constituem equipa

Apelos

2

A ferramenta fo

CISION

ID: 73921315

Diário de Aveiro

07-03-2018

Méio: Imprensa

País: Portugal

Período: Diária

Âmbito: Regional

Pág: 3

Cor: Cor

Área: 20,75 x 21,36 cm²

Corta: 1 de 1



Biólogos da UA desenvolvem "detective" de bivalves



INVESTIGAÇÃO APLICADA À BIOECONOMIA DO MAR





Ameijoa japonesa
Venerupis philippinarum



Captura ilegal de ameijoa japonesa no Estuário do Tejo... Mais de 150 pescadores-escravos tailandeses identificados!

<https://expresso.pt/sociedade/2017-12-31-Escravos-do-rio-1>



AUTORIDADE MARÍTIMA NACIONAL



AUTORIDADE DE SEGURANÇA ALIMENTAR E ECONÓMICA
ÓRGÃO DE POLÍCIA CRIMINAL



INVESTIGAÇÃO APLICADA À BIOECONOMIA DO MAR





AUTORIDADE MARÍTIMA NACIONAL

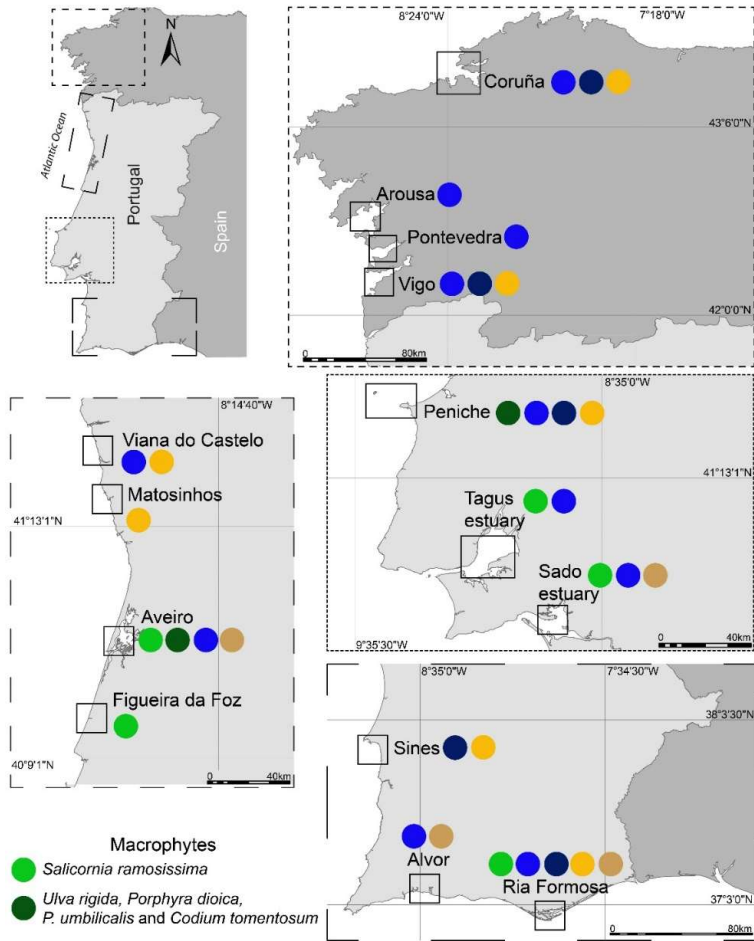


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• **TraSeafood - Rastreabilidade da Origem Geográfica como uma Via de Valorização Inteligente dos Recursos Marinhos Endógenos**

Macrophytes

- Sea asparagus (*Salicornia ramosissima*) - sprouts & seeds (biochemical & elemental)
- Sea lettuce (*Ulva rigida*) - lamina (biochemical & elemental)
- Black laver (*Porphyra dioica*) - lamina (biochemical & elemental)
- Purple laver (*Porphyra umbilicalis*) - lamina (biochemical & elemental)
- Velvet horn (*Codium tomentosum*) - branches (biochemical & elemental)

Invertebrates

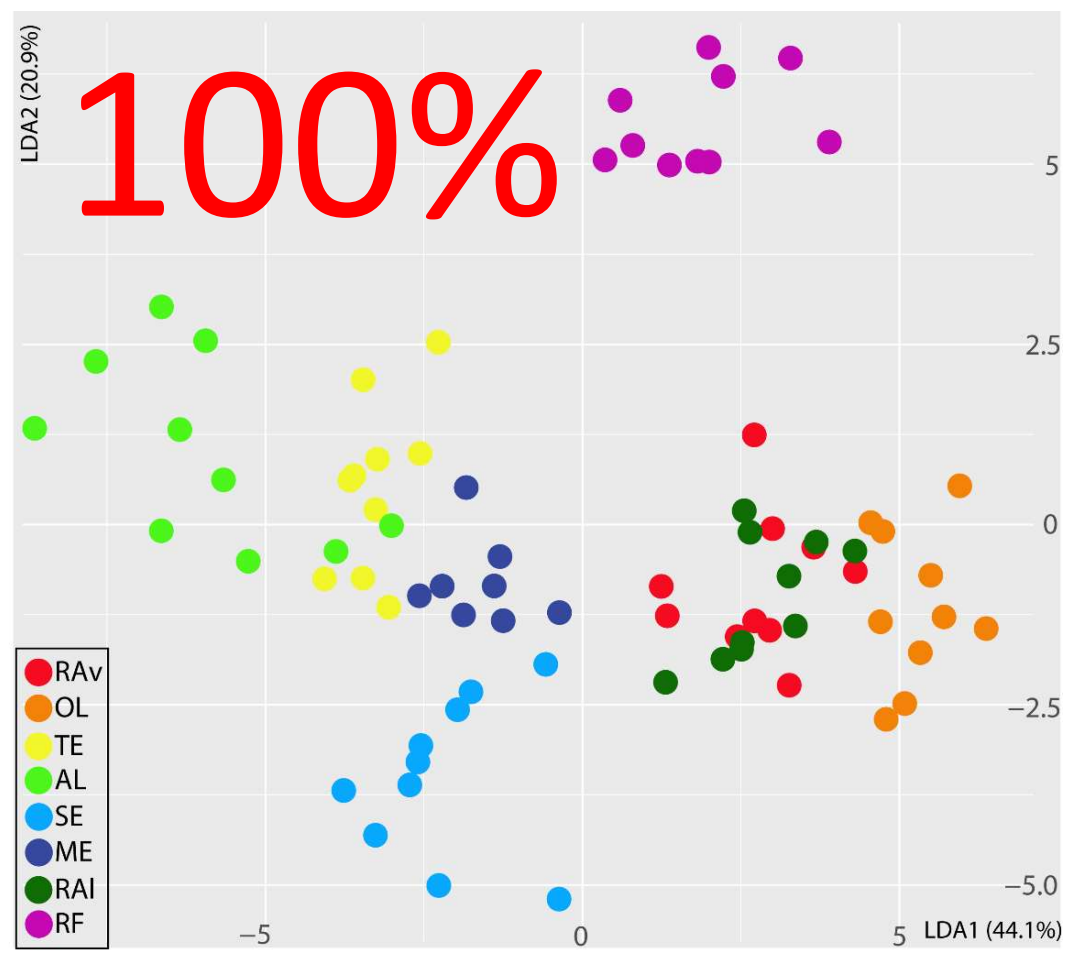
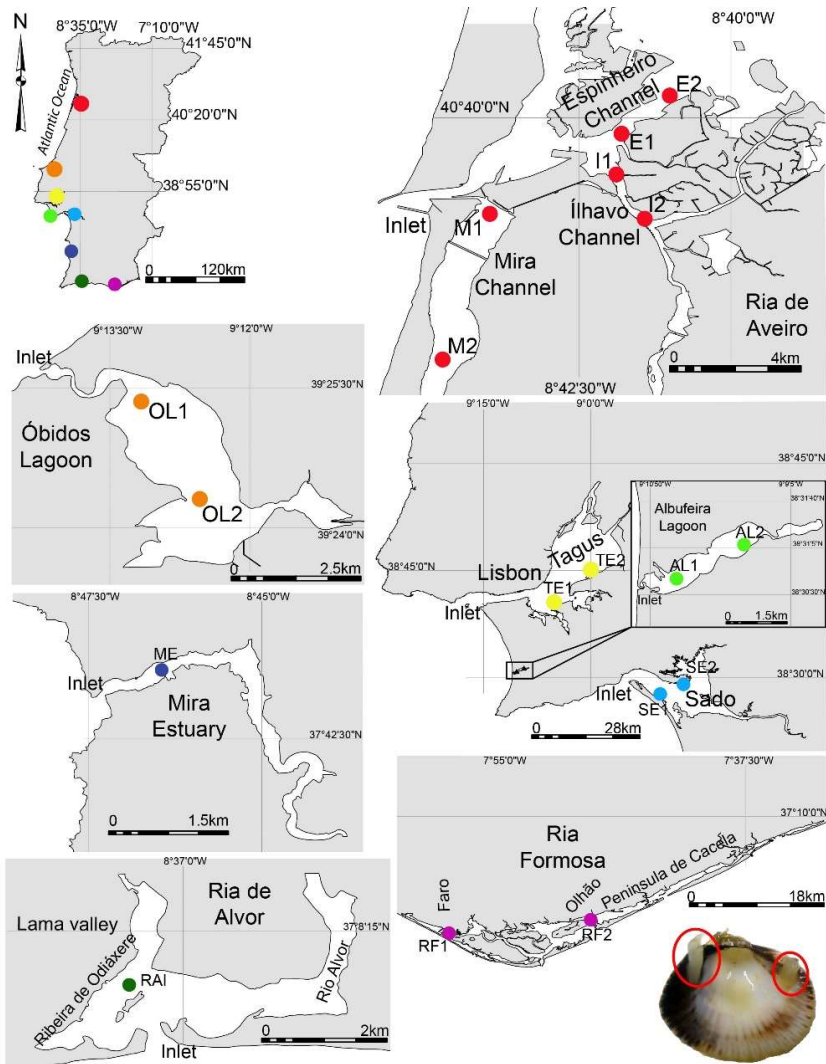
- Common octopus (*Octopus vulgaris*) - arm muscle (biochemical) & beak (elemental)
- Goose barnacles (*Pollicipes pollicipes*) - peduncle muscle (biochemical) & plates (elemental)
- Mediterranean mussel (*Mytilus galloprovincialis*) - adductor muscle (biochemical) & shell (elemental)
- Common cockle (*Cerastoderma edule*) - adductor muscle (biochemical) & shell (elemental)
- Grooved carpet clam (*Ruditapes decussatus*) - adductor muscle (biochemical) & shell (elemental)
- Japanese oyster (*Crassostrea gigas*) - adductor muscle (biochemical) & shell (elemental)
- Manila clam (*Ruditapes philippinarum*) - adductor muscle (biochemical) & shell (elemental)

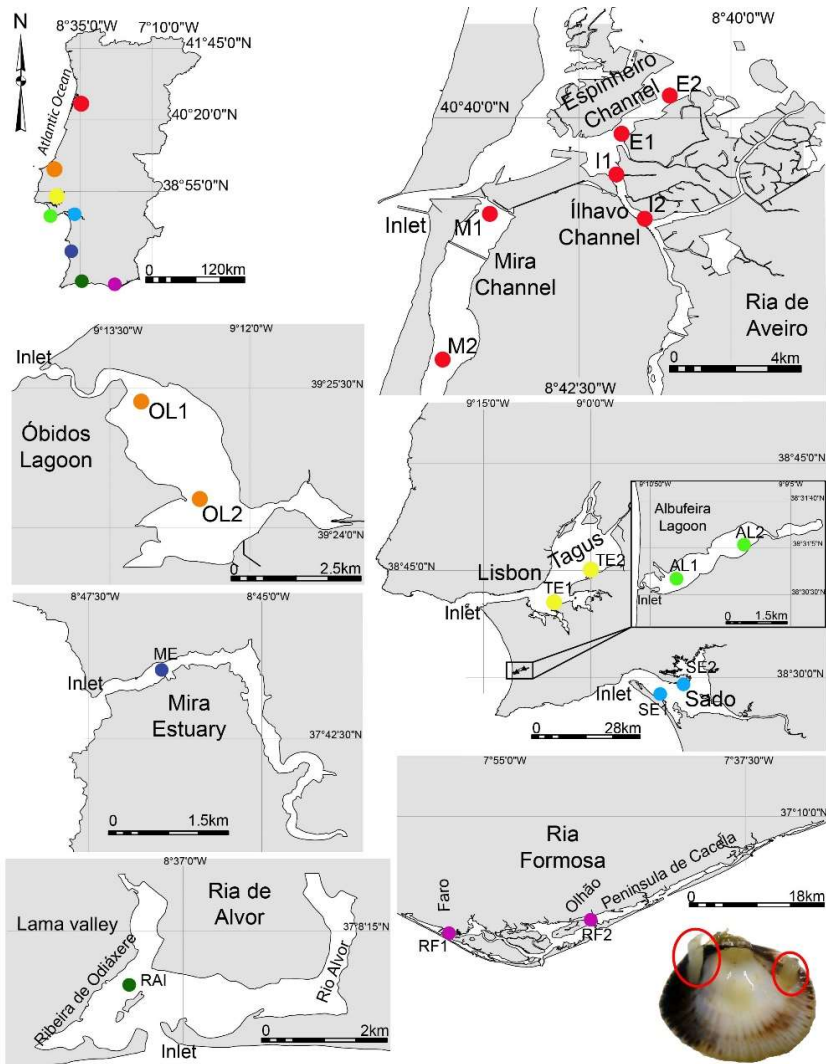
Fish

- Sardine (*Sardina pilchardus*) - scales (biochemical & elemental)
- Chub mackerel (*Scomber japonicus*) - scales (biochemical & elemental)
- Atlantic horse mackerel (*Trachurus trachurus*) - scales (biochemical & elemental)
- Gillhead seabream (*Gobius aurata*) - scales (biochemical & elemental)
- European seabass (*Dicentrarchus labrax*) - scales (biochemical & elemental)

PTDC/BIA-BMA/29491/2017







Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Food Control

journal homepage: www.elsevier.com/locate/foodcont



Spatio-temporal variability in the fatty acid profile of the adductor muscle of the common cockle *Cerastoderma edule* and its relevance for tracing geographic origin



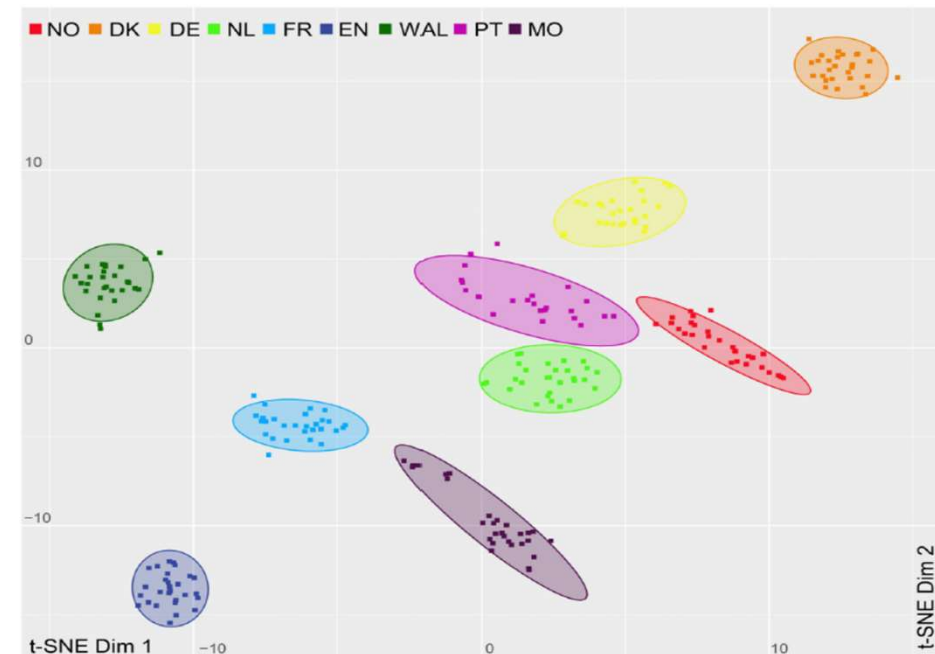
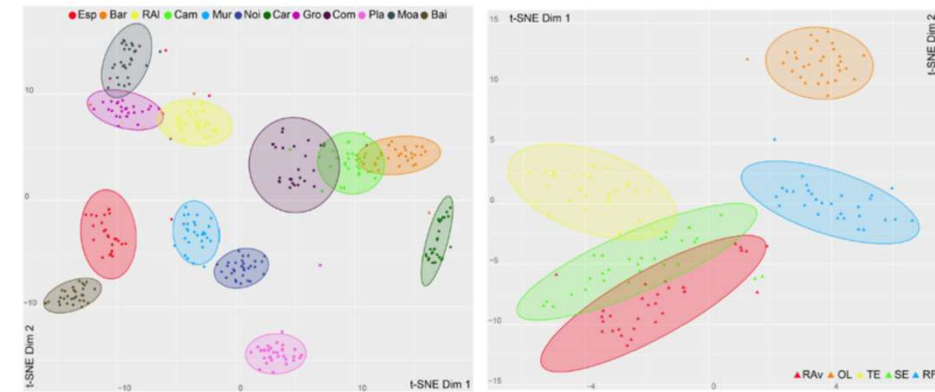
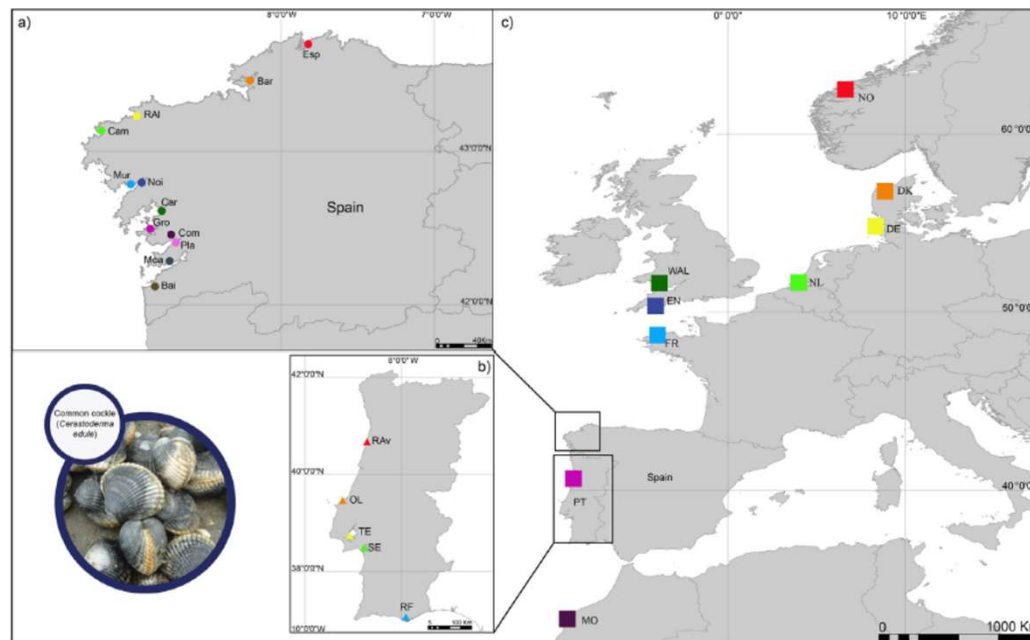
Fernando Ricardo ^{a,*}, Elisabete Maciel ^{a,b}, M. Rosário Domingues ^b, Ricardo Calado ^{a,**}





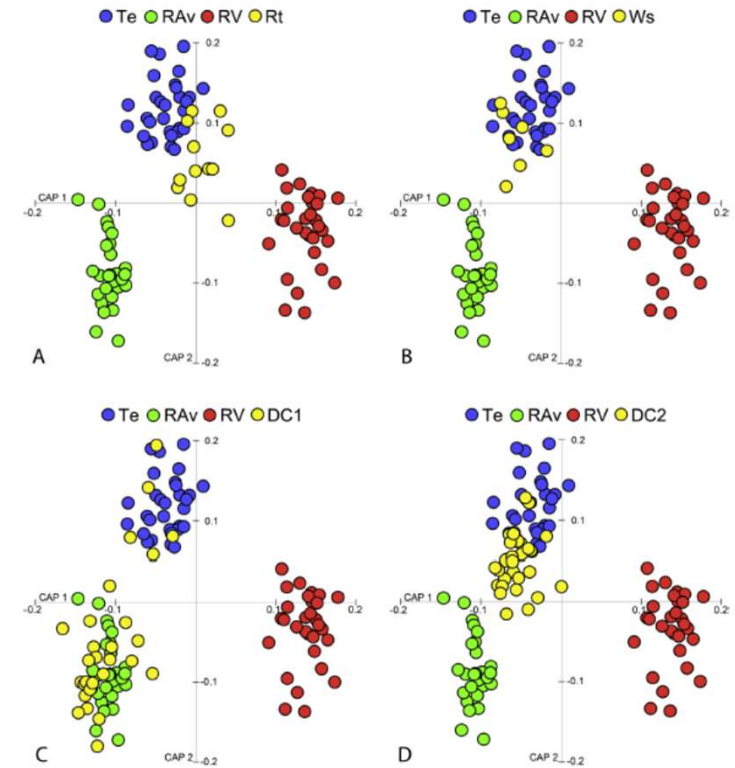
Assessing the elemental fingerprints of cockle shells (*Cerastoderma edule*) to confirm their geographic origin from regional to international spatial scales

Fernando Ricardo ^{a,*}, Renato Mamede ^a, Alicia L. Bruzos ^{b,c}, Seila Díaz ^{b,c}, Julien Thébault ^d, Eduardo Ferreira da Silva ^e, Carla Patinha ^e, Ricardo Calado ^{a,*}



Revealing the illegal harvesting of Manila clams (*Ruditapes philippinarum*) using fatty acid profiles of the adductor muscle

Renato Mamede^{a,*}, Fernando Ricardo^a, Andreia Santos^a, Seila Díaz^{b,c}, Sónia A.O. Santos^d, Regina Bispo^{e,f}, M. Rosário M. Domingues^{g,h}, Ricardo Calado^{a,**}





Novos desafios!

Combater a apanha ilegal na Ria Formosa de cavalos-marinhos e pepinos-do-mar que são enviados secos para a China!





Novos desafios!

Combater a apanha ilegal de enguias de vidro (meixão) em Portugal para exportação *in vivo* para a China!





CITAQUA

Centro de Inovação e Tecnologia em Aquacultura

- Laboratório Nacional para a Rastreabilidade dos Produtos da Pesca e Aquicultura
- Laboratório para a Produção 5.0 Super-Intensiva de Algas e Bivalves



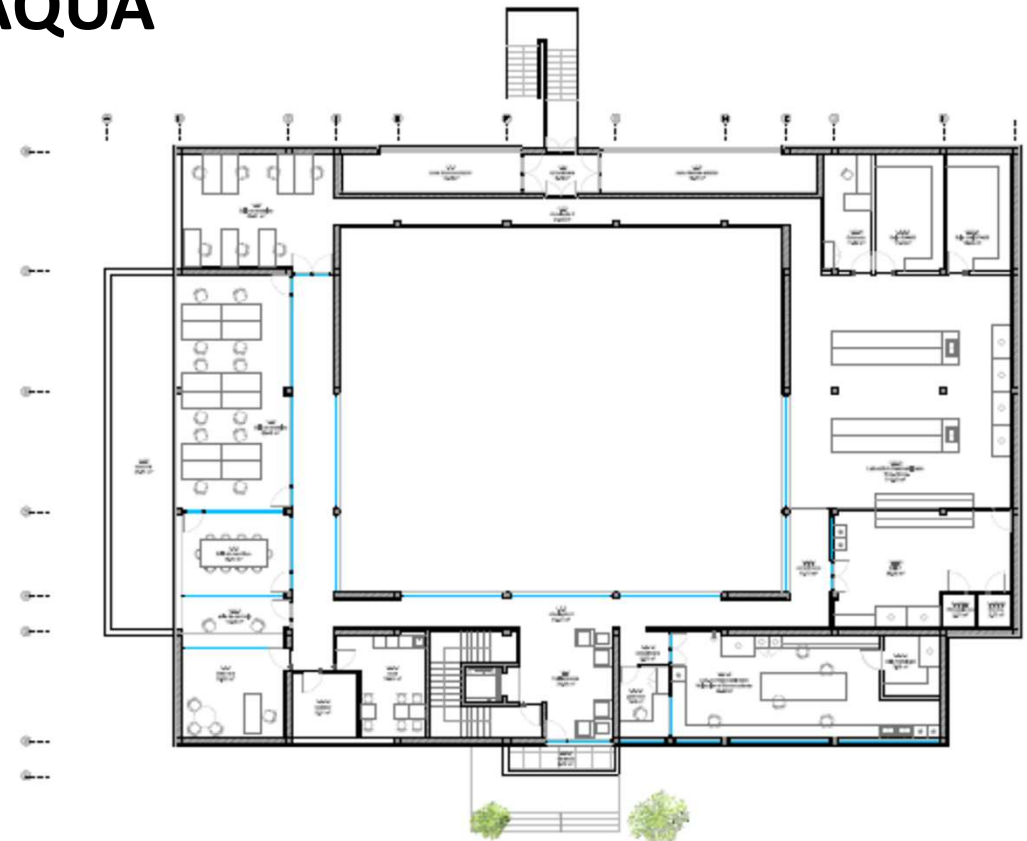
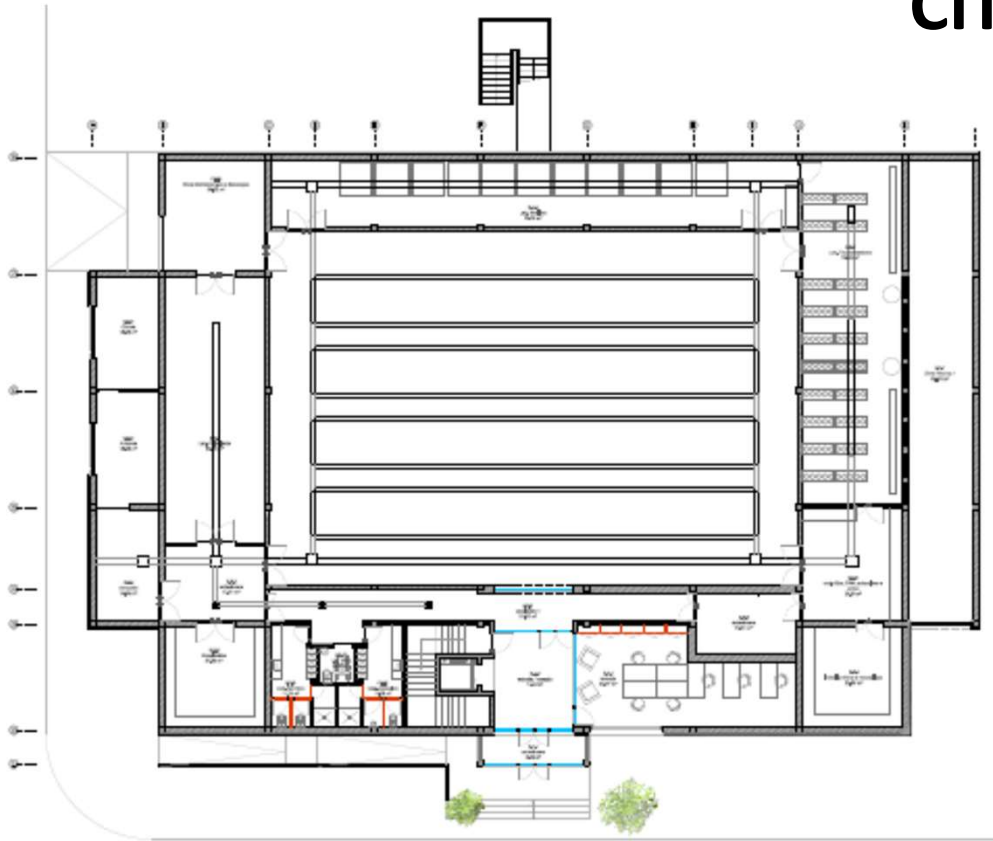
N.º 04/C10-i01/2022
Universidade de Aveiro
4 de fevereiro de 2022

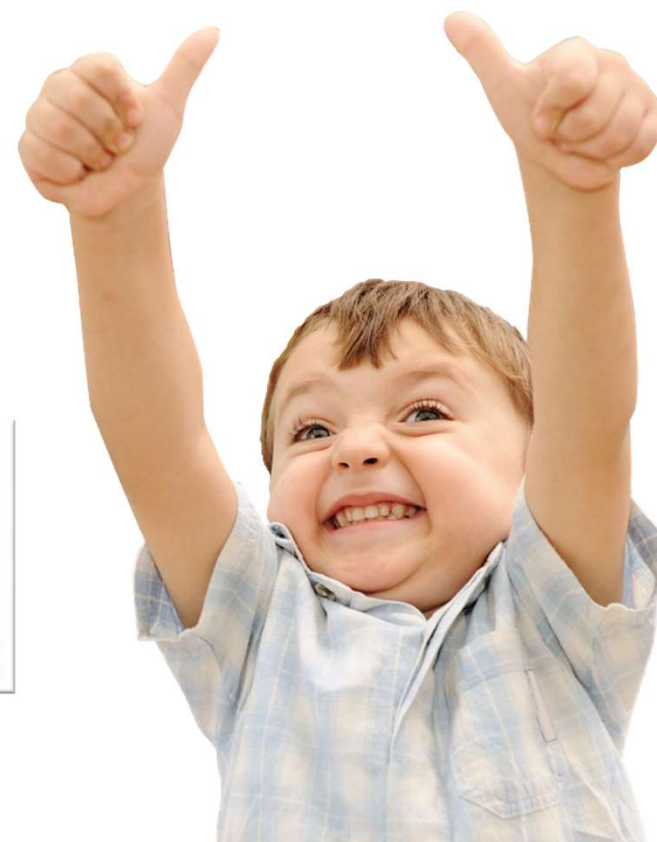
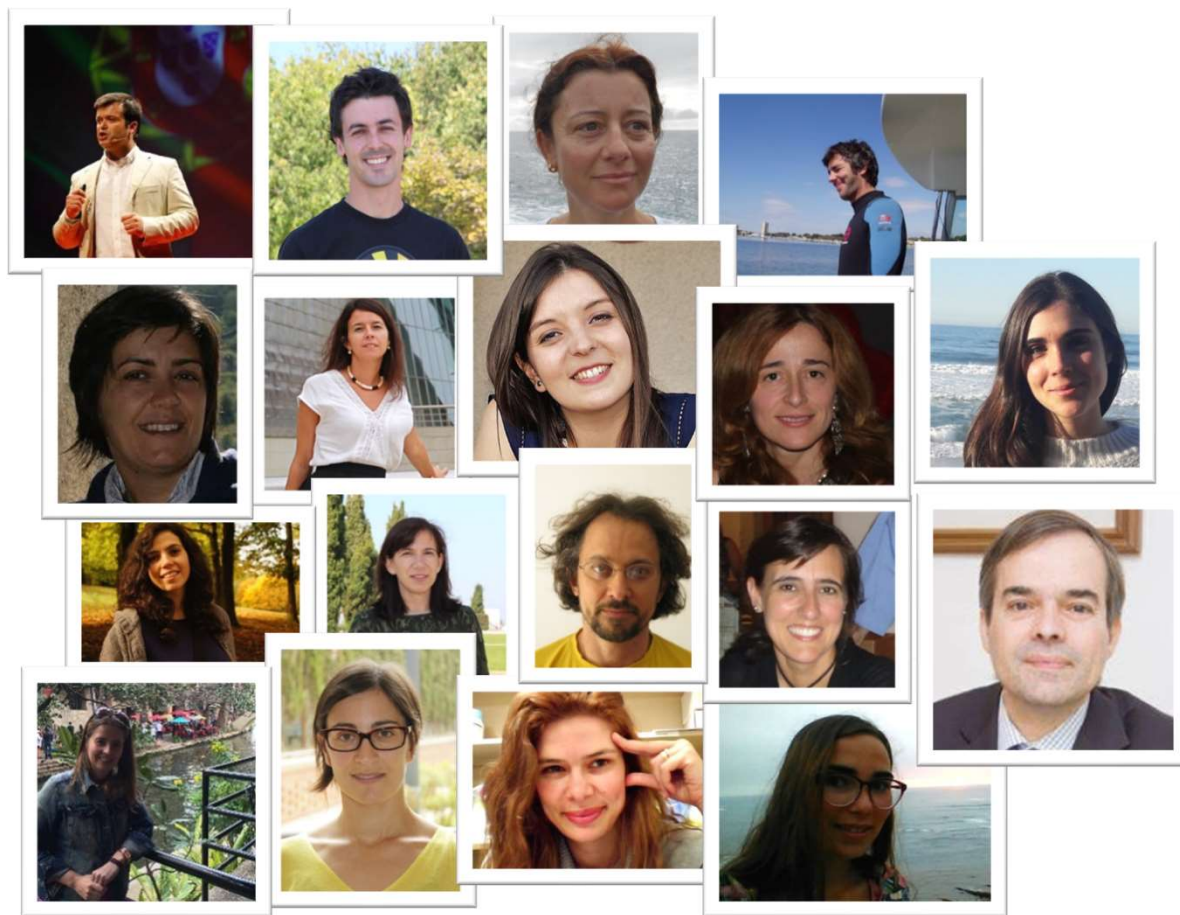
INVESTIMENTO TC-C10-i01 - Hub Azul, Rede de Infraestruturas para a Economia Azul

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Obrigado! Efcharistó!
Gracias! Shkran!
Thank you! Takk!
Merci! Arigatō!
Grazie! Gamsahaeyo!
Danke! Rhxbcı!
Xièxiè! Asante!