« **Voltar ao Projecto**

FCT Fundação para a Ciência e a Tecnologia

MINISTÉRIO DA EDUCAÇÃO E CIÊNCIA

Relatório de Progresso

[Relatório de Progresso Lacrado com Sucesso a 31-12-2020]

Informação:

Qualquer dúvida relacionada com o preenchimento do Formulário de Relatório de Progresso, por favor consulte o link "Notas e Informações", Relatórios Científicos de Progresso.

Atenção:
- A sessão expira ao fim de **20 minutos** de inactividade!
- O formato da data a utilizar é **dd-mm-yyyy**

Formulário Relatório de Progresso - Componente Científica

Relatório de Progresso nº 2

Período a que o relatório diz respeito:

Data de início: 01-08-2019

Data de fim: 31-07-2020

1. Identificação do Projecto

Referência do Projecto: PTDC/CTA-AMB/29105/2017

Investigador Responsável: Christos Gkenas

Instituição Proponente: FCiências.ID - Associação para a Investigação e Desenvolvimento de Ciências (Fciências.ID)

Data de Início: 01-08-2018 **Data de Fim**: 31-07-2021

Financiamento Concedido: € 236.187,46

2. Resumo dos Trabalhos Desenvolvidos e Desvios à Proposta aprovada

Resumo dos trabalhos

Descreva de forma breve as actividades desenvolvidas **no período em apreço** e os resultados alcançados. Referia-se em concreto às tarefas que tiveram execução no período a que o relatório respeita.

In the second year of the project ISO-INVA (01 August 2019 – 31 July 2020), Tasks 1, 2, 3 and 4 were carried out as defined in the working plan of the project.

Task 1: Long term changes in community trophic structure
This task aims to quantify food web changes in food webs in the Lower Guadiana Basin (LGB) over the past 30 years, based on Stable Isotope Analysis (SIA) of museum - archived and contemporary fishes.
In the second year of the project, we concluded the collection of archived samples in the Museu Nacional de História Natural e da Ciência (MUHNAC). Specifically, 181 individuals of 6 native fish species and 24 individuals of 4 non-native fish species sampled during 1978-1987 and 83 individuals of 6 native fish species and 174 individuals of 4 non-native fish species sampled during 1999-2004 were selected for analysis (Table 1). Whenever possible, samples with at least 5 individuals of each species were selected across tributaries to get a representative coverage of the LGB. Because of body size restrictions in museum collections, we primarily selected the largest adult individuals for fin-clip harvesting. Tissues samples were removed from the outer edges of the pelvic fins, rinsed with distilled water, and stored in 70% alcohol for later analysis. Because there was a lack of archived baseline resources, we collected prey items from gut contents of the archived fish. Prey items were identified to the lowest possible taxonomic level and stored in 70% alcohol (Table 2). In overall, we collected 249 prey samples which will be used to assess shifts in baseline isotope values over time. All fish and prey samples are now ready to be send for analysis at

the Centro de Recursos em Iso´topos Esta´veis (CRIE) in the Faculdade de Ciências da Universidade de Lisboa (FCUL).

Task 2: Environmental and Invader effects on the food web structure
This task aims to examine changes in trophic diversity in contemporary assemblages associated with biological invasions and environmental variability, based on SIA.
During the second year of the project, we concluded the preparation of the samples of fish fin clips and baseline resources (i.e., leaves, periphyton, macrophytes, zooplankton and benthic and terrestrial invertebrates) for SIA. Specifically, fish fin samples were oven dried, and samples of baseline resources were sorted, identified, oven dried, lyophilized and crushed. In total 2052 samples of fish fins and 1222 of baseline resources were processed and sent for analysis at the Centro de Recursos em Iso´topos Esta´veis (CRIE), in FCUL. From these totals, 1093 fish fins have already been analysed for stable isotopes. Likewise, 37 unfiltered water samples and 37 filters were analysed for dissolved nutrients (N-NH4 and P-PO4) and chlorophyll a at the Centro de Ciências do Mar e do Ambiente (MARE) in FCUL, and 37 filtered water samples were analysed for dissolved organic carbon (DOC) at the Universidade de Vigo. All data have been organized and incorporated in dedicated databases.
We started the analysis of fish and environmental data collected in the LGB in 2019. The environmental data set was complemented with variables derived from geoinformatics databases (e.g. elevation, stream order, distance to the nearest reservoir) and spatial data (i.e. Euclidian and Hydrological distances) were obtained in GIS. We conducted both regression and ordination analyses aiming to clarify the relative importance of environmental and spatial variables in structuring fish assemblages.

Task 3: Intraspecific functional influences in trophic structuring
This task aims to identify the functional traits of non-native fishes that impact the trophic structure of recipient assemblages.
During the second year of the project, we concluded the morphological analysis of fish samples collected in the LGB in 2019. In total, 279 fish were analyzed for morphological traits associated with food acquisition and locomotion (Table 3). Specifically, fish were measured for 7 traits associated with food acquisition and 10 traits associated with locomotion, using digital caliper and picture analysis with the Photoshop software. Prior to data collection, trial photographs were taken to optimize image collection and trait measurement.

Task 4: Public awareness about Fish Invasions
This task aims to enhance understanding of the ecological impacts of invasive fishes through public awareness and outreach.
During the second year of the project, we launched the official website of the ISO-INVA project (https://www.isoinva.com/), which will be used to disseminate our findings and host downloadable materials, including publications, technical reports and press releases. We drafted one C-fold tryptic flyer for the public with information about the main objectives of the project and the application of stable isotopes in food web assessment (Figure 1). Due to the worldwide pandemic state, this flyer was projected for virtual distribution. A printable roll-up was also drafted to advertise the project (Figure 2).
During this period, data derived in the frame of ISO-INVA project were included in a manuscript about the current distribution of recreational non-native fish species in Portugal prepared in co-authorship with teams from other research projects and submitted to a peer-review journal.

Desvios à Proposta Aprovada

Se tiver havido desvios à proposta aprovada, quer do ponto de vista científico como financeiro, aponte os desvios e justifique-os. Se teve dificuldades na execução do plano de trabalhos aprovado, identifique-os e indique de que modo pretende ultrapassá-los. Se no período em apreço tiver informado a FCT sobre alteração orçamental inter-rubricas (necessitem ou não de autorização por parte da FCT), indique aqui o motivo.

There were no substantial deviations to the scientific working plan and tasks of the project. However, there were major changes to the calendar and some adjustments in the research team of the project, which are indicated and justified below:

? The Covid-19 pandemic and the consequent lockdown and further restriction of activities in both the MUHNAC and in the FCUL resulted in considerable disruptions in the timeline of the project and led to major delays in the development of all tasks. Particularly, this: (i) halted the collection of archived fish fins and prey samples resources for task 1, thus preventing all the subsequent analyses; (ii) resulted in the interruption of the SIA for task 2, whose conclusion was still not possible; (iii) halted the morphological analysis of fish for task 3, given it was not possible to receive appropriate training in due time, and (iv) postponed the production of communication materials of the project, with limits to dissemination activities implying significant adjustments in task 4.

? After assuring that the tasks and objectives of the project ISO-INVA remained guaranteed, we requested and were authorized by FCT to replace the CoPI of the project Filipe Ribeiro by Maria Filomena Magalhães from the start date of the project (01/08/2018) onwards.

Some deviations were also introduced in the budget of the project, which are listed and justified below:

? To support the efforts of the research team in the laboratorial preparation of the fish and baseline samples collected in the LGB in July 2019, we requested and were authorized by FCT to hire a MSc research fellow for a period of 3 months starting on the 16th of August 2019. This had a cost of € 2.995,35 which was covered by the "HUMAN RESOURCES". To further support the activities planned in tasks 2 and 3 of the project, we requested and were authorized by FCT to renew this contract for an additional period of 6 months. This had a cost of € 6.772,08 and was covered by transfers of € 2.500,00 and € 3.000,00 from "SCIENTIFIC INSTRUMENTS AND EQUIPMENT" and "MISSIONS" respectively to "HUMAN RESOURCES". However, after two months of work, the research fellow decided to terminate the contract on the 31st of December 2019 due to personal reasons. This resulted in a remaining estimated amount of € 5,272.08 in the "HUMAN RESOURCES".

? Because Julien Cucherousset was unable to travel to Lisbon to supervise the activities of tasks 2 and 3 due to his other professional obligations at Paul Sabatier University (France), we requested and were authorized by FCT to conduct two missions to his laboratory. An amount of € 1.000,00 was already secured in the budget line "MISSIONS" for the travel of Julien Cucherousset and was approved to be used in these trips scheduled for April 2020. However, due to the COVID-19 pandemic the missions were cancelled.

? To improve knowledge on advanced statistical analysis of complex ecological datasets and stable isotope analysis, we

requested and were authorized by FCT to participate in the course "Data exploration, Regression, GLM & GAM with introduction to R" and in the course "Survivor´s Guide to Stable Isotope Ecology 2020" in Sicily, Italy. The participation in both courses had a fee of € 3.305,00 that was covered by transfer of € 3.300,00 from "HUMAN RESOURCES to "MISSIONS". However, the course "Survivor´s Guide to Stable Isotope Ecology 2020" was cancelled due to the COVID-19 pandemic, and the travel and fee expenses of € 2.705,00 were kept in "MISSIONS".

? To support the efforts of the team in prosecuting the project tasks, we requested and were authorized by FCT to make one acquisition of services for assistance in the morphological analysis of native and non-native fish species (task 3) and preparation of materials for communication and dissemination of science to the general public (task 4), starting in July 2020. The amount involved was € 4.981,50 and was covered by the "ACQUISITIONS OF OTHER GOODS AND SERVICES".

Equipa de Investigação

Nome	Cargo Função	Tarefas	%Tempo	Dt Entrada	Dt Saída	Desistiu
Christos Gkenas	Inv. Responsável	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	65%			
Cucherousset Julien	Investigador	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	35%			☐
João André Evaristo de Matos Gago	Investigador	Environmental and Invader effects on the food web (...) *** Public awareness about Fish Invasions	10%			☐
Maria Judite Silva Cardoso Alves	Investigador	Long term changes in community trophic structure *** Public awareness about Fish Invasions	10%			☐
Gisela Vitória Cheoo	Bolseiro	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	100%	16-08-2019	31-12-2019	☐
Maria Filomena Magalhães	Co-investigador Responsável	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	25%			☐
Filipe Manuel Vidas Ribeiro	Co-investigador Responsável anterior	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	25%		01-08-2018	☐
Joana Maria Sofio Martelo Callapez Martins	Contrato de trabalho	Long term changes in community trophic structure *** Environmental and Invader effects on the food web (...) *** Intraspecific functional influences in trophic str(...) *** Public awareness about Fish Invasions	100%	01-04-2019	31-07-2021	☐

3. Publicações

Apenas para o período a que respeita o Relatório de Progresso, indique trabalhos apresentadas ou aceites para publicação ou apresentação, e trabalhos submetidos no período a que o relatório respeita.

A informação pretendida neste campo é inserida em formato livre. Para cada publicação deve ser indicada a seguinte informação:

- Descrição, contendo os seguintes elementos:

  - Em livros ou monografias: autor(es), título, número e/ou identificação da edição, número do volume, lugar da publicação, número de páginas;

  - Em revistas científicas: autor(es), título, título da revista, lugar da publicação, número do volume, número da primeira e última página;

  - Em artigos ou abstracts de comunicações científicas ou outras participações de índole científica em congressos internacionais ou nacionais: autor(es), título do artigo ou comunicação, nome da publicação, volume, número de páginas;

- Estado, indicando a situação:

  - Publicado/Apresentado;

  - Aceite para publicação/apresentação;

  - Submetido.

Nos trabalhos aceites para apresentação ou publicação, a data de aceitação deve ser indicada no campo descrição.

Nota em 22-11-2011: Para os trabalhos que tenham sido publicados ou apresentados deve ser indicado o URL onde o mesmo possa ser consultado, devendo este URL ser mantido pelo mesmo período do dossier de projecto.

Exemplos:

- Aceite - I. Santos, J. Rodrigues, "Non linear control design of a team of autonomous vehicles", aceite (Dezembro de 2008) para apresentação na IEEE Conference on Control Systems, Madrid, Espanha, Maio de 2009. URL: http://www.xpto.xpto.pt

- Publicado - A. Silva, P. Oliveira, "Social behaviour of a dog colony in extreme conditions", Journal of Animal Behaviour, Elsevier, Vol. 2, Nº3, pp.373-395, September 2009. URL: http://www.xpto.xpto.pt

- Apresentado - V. Santos, J. Rodrigues, "Medical image segmentation for endoscopy applications", Proc. of the International Conference on Medical Imaging, Pittsburgh, USA, March 2009, pp. 304-312. URL: http://www.xpto.xpto.pt

- Submetido - M. Santos, P. Oliveira, "Comparative Analysis of Elephant Populations", submetido (Fevereiro de 2009) para apresentação na International Conference on Veterinary Studies, S. Paulo, Brasil, Novembro de 2009.

Nota em 01-02-2017: Chama-se a atenção para a necessidade absoluta do cumprimento das Normas de Informação e Publicidade disponíveis para consulta em http://www.fct.pt/apoios/projectos/docs/Normas_de_Informação_e_Publicidade_2016.pdf para projetos OE, e para projetos cofinanciados pelo FEDER disponíveis nos sites dos Programas Operacionais responsáveis pelos financiamentos.

- Submetido - Martelo, J.,da Costa, L.M., Ribeiro, D., Gago, J., Magalhães, M.F., Gante, H.F., Alves, M.J., Cheoo, G., Gkenas, C., Banha, F., Gama, M., Anastácio, P.M., Tiago, P.M., Ribeiro, F. Evaluating the range expansion of recreational non-native fishes in Portuguese freshwaters using scientific and citizen science data.

4. Indicadores de Realização Física

Neste quadro deve indicar os valores referentes ao período a que corresponde o Relatório de Progresso.

Neste quadro deve apenas indicar concretizações efectivas. Não indique publicações submetidas para publicação, nem teses que ainda não tenham sido discutidas.

Indicadores	Quantidade realizada
A - Publicações científicas	
51 - Publicações científicas em domínios científicos enquadráveis na RIS3	0
Livros ou capítulos de livros	0
Artigos em revistas internacionais	0
Artigos em revistas nacionais	0
B - Comunicações	
Comunicações em encontros científicos internacionais	0

Comunicações em encontros científicos nacionais	0
C - Relatórios	0
D - Organização de seminários e conferências	0
E - Formação avançada	
52 - Pedidos de patentes europeias (EPO)	0
Teses de doutoramento	0
Teses de mestrado	0
Outras	0
F - Modelos	0
G - Aplicações computacionais	0
H - Instalações piloto	0
I - Protótipos	0
J - Produtos	0
K - Produções/criações artísticas	0
L - Processos inovadores	0
M - Bases de dados curadas	0
N - Integração do conhecimento em atividades de formação superior	0
O - Patentes	
Patentes EPO	0
Outras patentes	0

5. Ficheiros Anexos (opcional)

Neste item poderá incluir, apenas se entender como estritamente necessário, ficheiros com formato PDF, que tenham sido referidos no relatório, por exemplo, gráficos, esquemas, fotografias.
O conjunto dos ficheiros (em número máximo de cinco) ou o arquivo comprimido a submeter não poderão ultrapassar 10MB.

Nome	Ponto do RP	Descrição	
Table 1.pdf		Table 1	
Table 2.pdf		Table 2	
Table 3.pdf		Table 3	
Figure 1.pdf		Figure 1	
Figure 2.pdf		Figure 2	
		Table 3	