



Genetic differentiation along an ocean/river gradient captures the signature of intragenerational selection in the European eel (*Anguilla anguilla*)

Stellia Sebihi, Sylvie Oddou-Muratorio, Aurélie Manicki, Christophe Klopp, Pascale Coste, Emmanuel Huchet, Maren Ortiz-Zarragoitia, Valérie Bolliet

► To cite this version:

Stellia Sebihi, Sylvie Oddou-Muratorio, Aurélie Manicki, Christophe Klopp, Pascale Coste, et al.. Genetic differentiation along an ocean/river gradient captures the signature of intragenerational selection in the European eel (*Anguilla anguilla*). FSBI 2024 Annual Symposium, Jul 2024, Bilbao, Spain. <hal-04603141>

HAL Id: hal-04603141

<https://hal.science/hal-04603141v1>

Submitted on 2 Oct 2024

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

ORAL PRESENTATION

Genetic differentiation along an ocean/river gradient captures the signature of intragenerational selection in the European eel (*Anguilla anguilla*)

Stellia Sebih^{* [1,3]}, Sylvie Muratorio^[1], Aurélie Manicki^[1], Christophe Klopp^[2], Pascale Coste^[1], Emmanuel Huchet^[1], Maren Ortiz-Zarragoitia^[3], Valérie Bolliet^[1]

1. UMR ECOBIOP UPPA - INRAE. MIRA. UMR 1224. 64310. Saint-Pée-sur-Nivelle. France

2. Sigénac, Genotoul Bioinfo, BioInfoMics, MIAT UR875, INRAE, Castanet Tolosan, France

3. CBET Research Group. Department of Zoology and Cell Biology. Faculty of Science

European eel has received considerable attention in recent decades due to its significant decline. This catadromous species presents numerous estuarine migratory tactics, ranging from residency in marine water (non-migrant, NM), to various degrees of upstream colonization through estuarine and freshwater ecosystems (migrant, M). Variation in individual physiological plastic traits, such as energetic status, only partially explain the difference in M vs NM tactics. Here, we investigated the genomic divergence between M and NM glass eels.

First, in a natural population along a gradient extending from the ocean to the dynamic tidal limit of the Adour River, six samples were collected, at two extreme sites (Ocean vs Upstream) and over three years (2019, 2020 & 2022). We hypothesize that upstream pools are mostly composed of M whereas ocean pools are a mixture of M and NM glass eels. Moreover, 35 M and 35 NM glass eels were identified in an experimental device that mimics alternating tidal currents.

Whole genome pool sequencing of the eight pools (~35 ind. each) revealed 6.28×10^7 SNPs variants. Two different approaches, BayPass and PCAdapt, found respectively 0.02% and 0.3% of SNPs with a significantly higher genetic differentiation between Ocean vs Upstream pools ($F_{ST}=0.67$ on average) than the pangenomic estimate ($F_{ST}=-0.006$). Using a local score approach, BayPass filtered 202 outliers in 62 genomic regions of high genetic differentiation, while PCAdapt filtered 2394 outliers in 92 larger genomic regions. A first functional analysis of these genomic regions shows that immune system and several cellular processes could be involved in spatial sorting along estuary gradients.

Combined with studies in *A. rostrata*, our results support that variation in eel migration capacity is partly genetically determined. Thus, while panmixia maintains high level of genetic diversity, spatial sorting could promote intra-generational genetic divergence between habitats of European eels.