

9th MEETING OF THE SCIENTIFIC COMMITTEE

Held virtually, 27 September to 2 October 2021

SC9-JM04

Genetics of Chilean Jack mackerel in the South Pacific Ocean

Chile

Proposal research FIPA 2021-08: “Population genetics of Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean”

Main

To develop a study that contributes to reduce uncertainty in the management of the Chilean jack mackerel (*Trachurus murphyi*) fishery by investigating the genetic signatures of the connectivity and admixture proportions of this species, key topics that are needed to understand its population dynamics.

Goals

- 1) Generate an adequate sampling design to carry out the genetic characterization of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
- 2) Identify and analyze molecular markers (SNPs) for the Chilean jack mackerel (*Trachurus murphyi*) to identify genetically divergent groups in the South Pacific Ocean, comparing its patterns of genetic divergence with previously documented phenotypic and biological fishing gradients.
- 3) Identify and define the geographical limits of potential genetically divergent groups of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
- 4) Evaluate the genetic connectivity and admixture proportions between the potential genetically divergent groups of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
- 5) Generate a conceptual model that allows relating the genetic divergence patterns and connectivity processes of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.

Expected Results

1. The genetic characterization of the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
2. The genetic identification of divergent groups of Chilean jack mackerel (*Trachurus murphyi*) using molecular markers like SNPs. In addition, we expected to obtain respective comparisons of the identified genetic divergence patterns with previously documented phenotypic and biological fishery gradients.
3. The delimitation of the number and geographical boundaries of the genetically divergent groups of Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
4. The estimations of the genetic connectivity degree and admixture proportions between genetically divergent groups in the Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.
5. A conceptual model that allows relating the genetic divergence patterns and the connectivity process of Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean.

Activity plan FIPA 2021-28 Population genetics of Chilean jack mackerel (*Trachurus murphyi*) in the South Pacific Ocean

Activity \ Month	MONTH 2021-2022														
	Sept	Oct	Nov	Dec	Jan	Feb	Mar	Abr	May	Jun	Jul	Aug	Sept	Oct	Nov
1. Actividades Generales															
Coordination meeting UdeC-INPESCA-Subpesca-FIPA	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
International Workshop 1									X						
International Workshop 2													X		
Workshop - Scientific Committee (SC) of Jurel									X						
2. Objective 1															
2.1. Sample/collection of individuals	X	X	X	X	X	X	X								
2.2. Sample processing	X	X	X	X	X	X	X	x	X						
3. Objective 2															
3.1. Sampling and genomic DNA isolation				X											
3.4. SNPs discovery / High-throughput sequencing, QC of raw reads, and read mapping	x	x	x	X	X	X	X								
3.6. SNPs discovery / Variant calling and filtering of SNPs		x	x	x	x	x	x	x							
4. Objective 3															
4.6. SNPs database generation			x	x	x	x	x	x	X						
4.7. Estimate the genetic diversity				x	x	x	x	x	X	X					
4.8. Population genetic structure identification						x	x	x	X	X	X				
5. Objective 4															
5.1 Genetic connectivity estimates							x	x	x	x	X				
5.2. Genetic mixing ratio estimates							x	x	x	x	X				
6. Objective 5															
6.1. Update of the hydrodynamic model for horse mackerel of the PS	X	X	X				X								
6.2. Update of the biophysical model for jack mackerel from the PS	X	X	X				X								
6.3. Analysis of connectivity processes in jack mackerel in the PS								X	X	X	X	X			
Progress Report								X							
Prefinal Report												X			
Final workshop														X	
Final Reporte															X

Collection details of jack mackerel in the project FIPA 2021-08

Area	ID	Number of individuals
Ecuador (INP)	ECU	50
Perú Norte (Islas Lobos de Afuera)	ILA	50
Perú Centro-Norte (Chimbote)	CHI	50
Perú Centro-Sur (Paracas)	PAR	50
Chile (Arica)	ARI	50
Chile (Iquique)	IQU	50
Chile (Caldera)	CAL	50
Chile (Coquimbo)	COQ	50
Chile Centro-Sur (Isla Mocha)	CSM	50
Chile (Puerto Montt)	PMO	50
Nueva Zelandia	NZE	50
Alta Mar 1 (Centro-Sur)	AM1	50
Alta Mar 2 (frente a Caldera: La Bota)	AM2	50