

## SC 12 – WP 11

### Population genetics and connectivity of Jumbo flying squid

At the previous SC meetings, different delegations presented advances and results regarding the population genetic analysis of the jumbo flying squid, with results based on mtDNA and SNPs analysis but with different methodologies, which complicated the interpretation of the available information on the genetic population of the species ([SC6-SQ10](#), [SC6-SQ11](#), [SC7-SQ10](#), [SC7-SQ11](#), [SC7-SQ13](#), [SC9-SQ06](#), [SC9-SQ07](#), [SC10-SQ05](#), [SC10-SQ09\\_rev1](#), [SC10-SQ12](#), [SC11-SQ02](#), [SC11-SQ06](#), [SC12-SQ04](#))

During SC12, the Genetic group of delegations from Peru, Chile, China and Ecuador held conversations and agreed to develop a population genomic study of the jumbo flying squid, considering a consensus in the sampling design up to the data analysis.

The Group of Population Genetics on jumbo flying squid aims to evaluate the population genomics of the three phenotype-size groups, small (S), medium (M) and large (L), along the distribution range of the jumbo flying squid in the SE Pacific, considering the length at maturity in Table 1.

The genetic group of Jumbo flying squid agreed by consensus on the following:

- Spatial and temporal criteria for the sampling design, collecting in the areas E and O indicated in figure 1, number of females in maturity stages III and IV per phenotype-size group per area (n=30), during 2024-2025.
- Peru will collect samples in the E1 (S+M) and E2 (S+M+L) areas. China will sample in O1 (S+M), O2 (S+M+L), O3 (M+L), and O4 (L) areas. Chile will collect samples in E3 (L) and E4 (L), and Ecuador E1 (S+M). Samples will be collected until December 2025.
- A template will be provided for filling the biological data of sample, including sex, mantle length, gonadal maturity stage, coordinates of catch or sampling site, date and location.
- Muscle tissues or DNA samples will be sent to only one DNA sequencing facility (e.g., Novogene) and sequenced for the lcWGS (low coverage of the Whole Genome Sequencing) technique, and results will be provided to all the genetic group of jumbo giant squid.
- Protocols for tissues sampling, characteristics for DNA sequencing, pipelines and genomic population analysis, will be worked in virtual meetings.

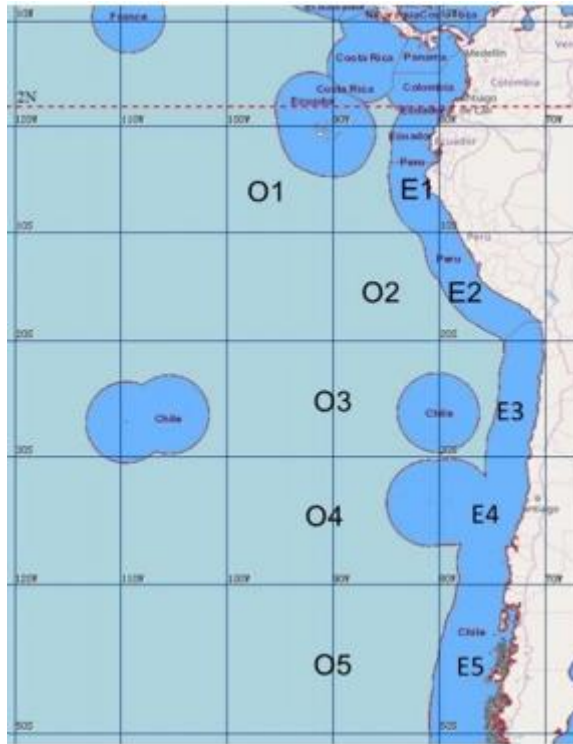


Figure 1. Areas for collecting samples along the Jumbo giant squid distribution (ref. Annex 9-SC06-Final Report)

Table 1. Summary table of the three groups or possible population subunits of *Dosidicus gigas* distinguishable by their length at maturity (after Nigmatullin et al. 2001) observed of the Peruvian coast (Obtained from Csirke et al. 2018)

Grupos según talla de madurez sexual ~ Groups by size at sexual maturity	Rango de longitud de manto al estado adulto (mm) ~ Range of mantle length at adult stage (mm)		Rango de distribución latitudinal ~ Latitudinal distribution range	Años de mayor incidencia observada en aguas peruanas ~ Years of higher incidence observed in Peruvian waters
	Machos ~ Males	Hembras ~ Females		
Talla pequeña ~ Small size	130 a 260	140 a 340	Cerca de la zona ecuatorial (latitudes bajas) ~ Close to the Equatorial zone (low latitudes)	1979-1983 & 1989-1999
Talla media ~ Medium size	240 a 420	280 a 600	Casi todo el rango de la especie excepto las latitudes altas ~ Almost the whole distribution range, except for the high latitudes	1979-1983, 1989-1999, 2002 & 2013
Talla grande ~ Large size	400 a 500+	550 a 1000+	Al norte de los 10°N, al sur de los 10°S y aguas frías a lo largo de la costa norte-centro del Perú ~ To the north of 10°N, to the south of 10°S and cold waters along the northern and central parts of the Peruvian coast	1958-1962, 1990 & 2000-2017

#### Reference

Csirke, J., Arguelles, J., Alegre, A., Ayón, P., Bouchon, M., Castillo, G., Castillo, R., Cisneros, R., Guevara-Carrasco, R., Lau, L., Mariátegui, L., Salazar, C., Tafur, R., Torrejón, J., Yamashiro, C. 2018. Biología, estructura poblacional y pesquería de pota o calamar gigante (*Dosidicus gigas*) en el Perú. Bol Inst Mar Perú. 33(2): 302-364.