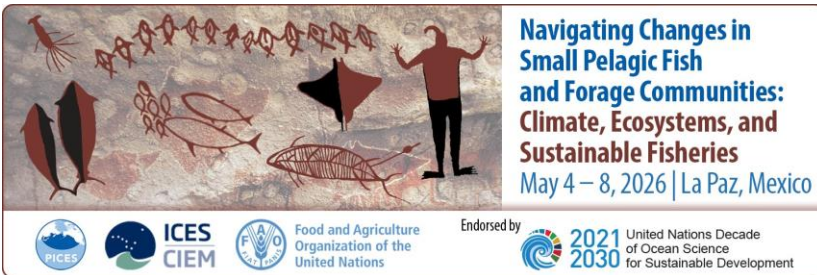


# Are Horse Mackerel, Mackerel, and Round Sardinella Viable Complementary species to the Sardine?

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## INTRODUCTION

European sardine 

 Among the most two target blue fish species:

 Economic prize

 Healthy protein and fatty acid resource

 Their populations depict signs of overfishing

 Banning period during winter months (Nov-Feb)

## METHODS

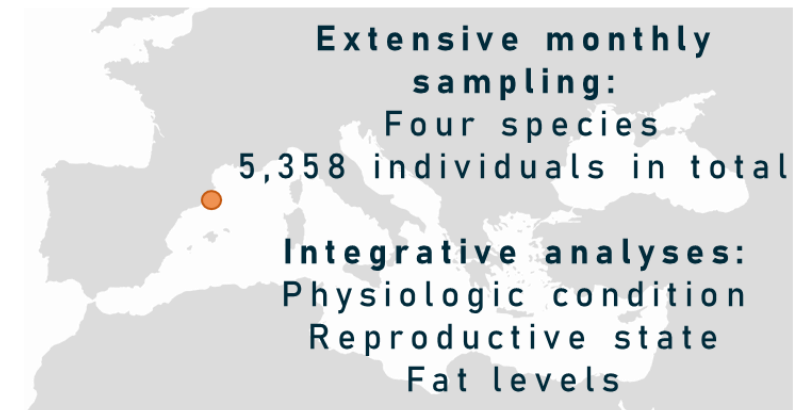
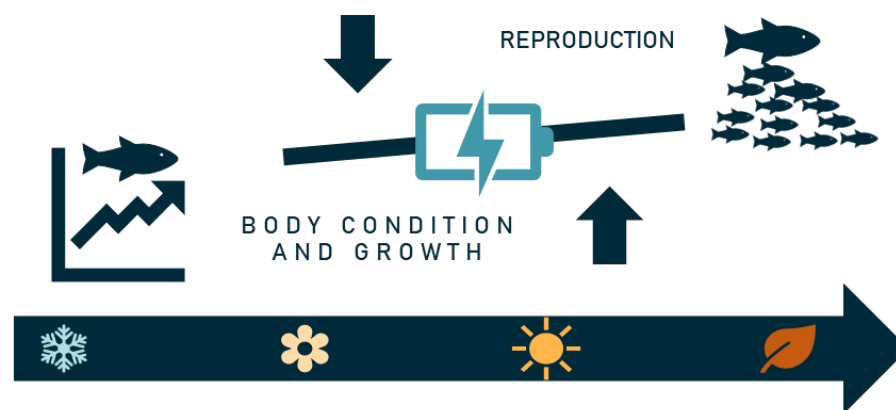


Table 1 Total individuals analysed ( $N_T$ ), including immature individuals ( $N_I$ ), for each species. The mean total length ( $L_T$ ) with its standard deviation ( $SD$ ) and the mean total weight ( $W_T$ ) with its standard deviation ( $SD$ ) are presented for all individuals of each species.

Species	$N_T$	$N_I$	$L_T \pm SD$ (mm)	$W_T \pm SD$ (g)
European sardine ( <i>Sardina pilchardus</i> )	1,997	52	138.186 $\pm$ 10.149	20.764 $\pm$ 7.317
Atlantic horse mackerel ( <i>Trachurus trachurus</i> )	1,202	70	199.003 $\pm$ 28.859	67.189 $\pm$ 33.051
Atlantic mackerel ( <i>Scomber scombrus</i> )	900	146	282.694 $\pm$ 23.211	177.291 $\pm$ 48.764
Round sardinella ( <i>Sardinella aurita</i> )	1,259	385	189.254 $\pm$ 25.856	50.932 $\pm$ 22.644

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## RESULTS



European sardine



Atlantic horse mackerel

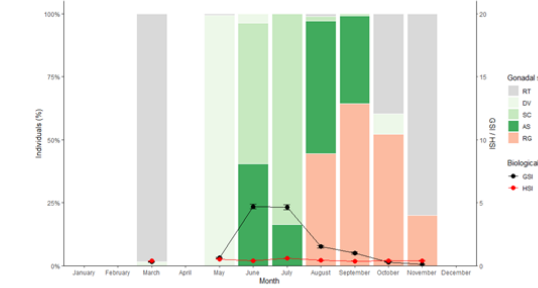
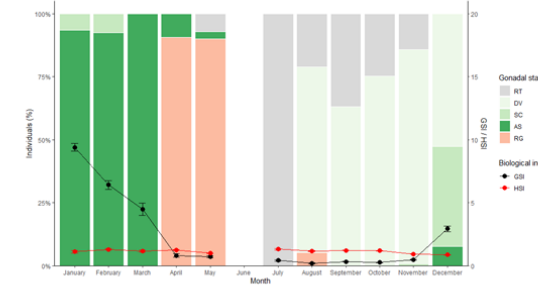
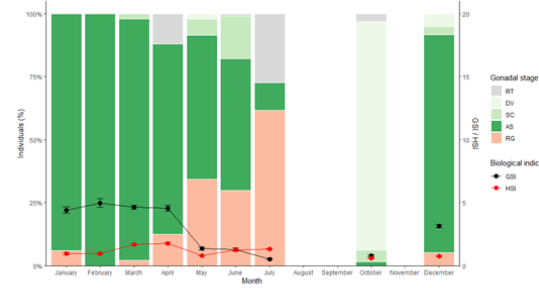
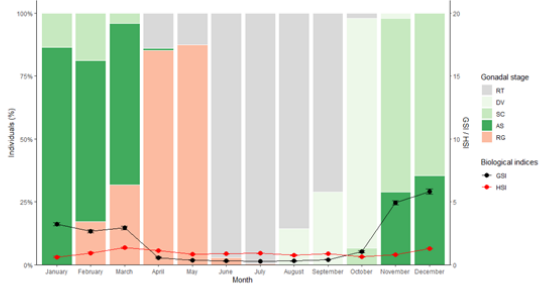


Atlantic mackerel

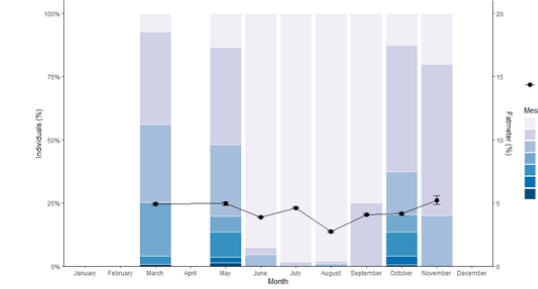
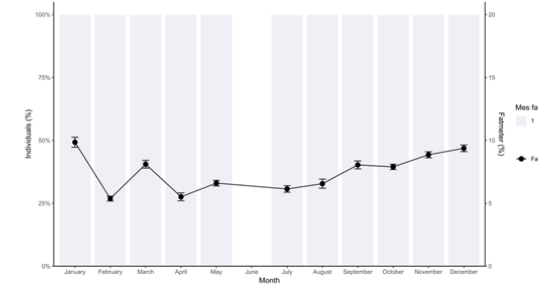
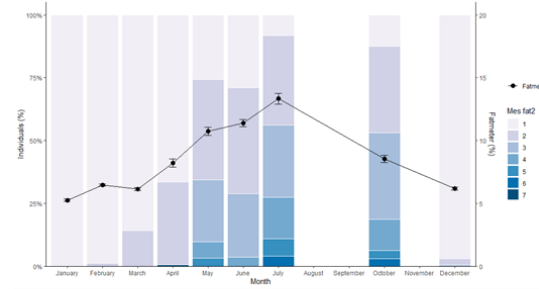
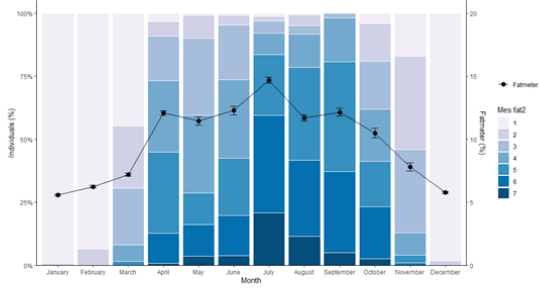


Round sardinella

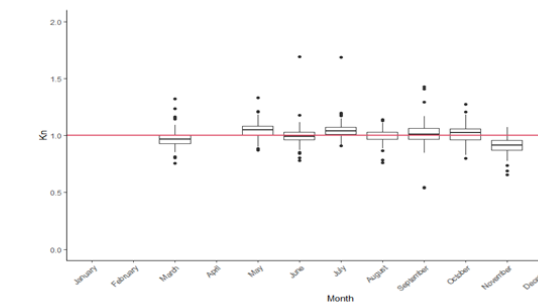
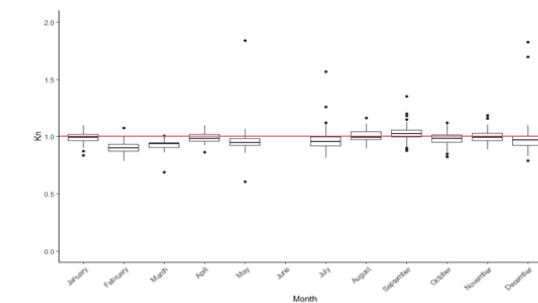
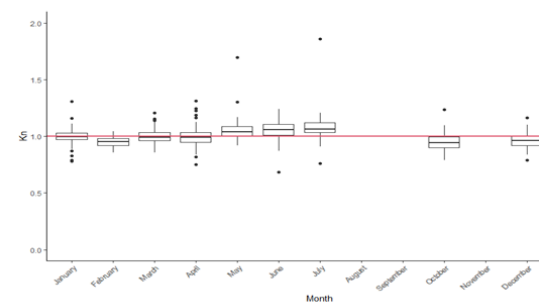
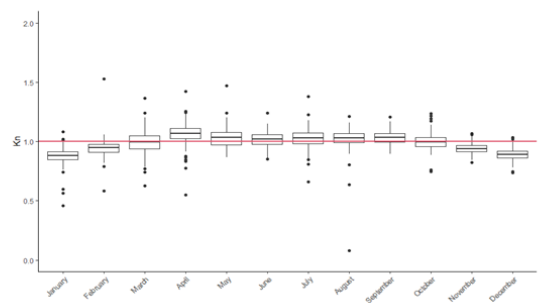
Reproduction



Fat levels



Condition



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European sardine



Atlantic horse mackerel



Atlantic mackerel



Round sardinella

## CONCLUSIONS

- The Atlantic horse mackerel is a promising candidate, with high levels of fatty acids and resilient populations coping their energetic demands
- The Atlantic mackerel presented a low physiological condition, possibly indicating struggles to cope with the reproduction and body maintenance
- The Round sardinella presented low fatty acid levels but can still be a candidate due to low parasitic incidence and low metal contamination

