Colonization by marine ichtyoplankton on mudflat in the Gironde estuary

V. Andreola, Mario Lepage

Colonization by marine ichthyoplankton of mudflats in the Gironde estuary

V. Andreola and M. Lepage *

Gironde estuary needs habitat restoration because of strong anthropogenic pressures

Introduction

Restoring fish habitats in estuaries is at present a major concern for stakeholders. Estuaries wetlands such as intertidal mudflats and marshes provide numerous ecological services and act as essential habitats for many species and this, from the youngest stages of development. Actually, many larvae of marine species whose eggs hatch at sea colonize the estuary and especially the mudflats of the latter via the tides. There they settle for a short period, they feed and grow.

Goals and questions

❖ **To acquire essential knowledge about the distribution of the fish larvae originating in the Atlantic Ocean in different mudflats**

➢ **How are structured the ichthyoplankton populations of intertidal mudflats? Which species? (Where and when?) Which stages?**

❖ **To give information on where restoration action should be taken as to maximize the potentialities of new settler fish larvae.**

➢ **Are there differences in species diversity and abundances between the mudflats or between the two shores of the estuary?**

Methods

Fishing

Larvae were collected in Marsh and in May 2012, in different mudflats of the Gironde estuary (Figure 1). This survey will continue until end of 2012.

Sampling is done with a bongo-type net (Figure 2) and an epibenthic trawl (Figure 3). The mesh size is 500 µm for each nets. Each net is towed for 3 minutes and filtered volumes are calculated using flowmeters.

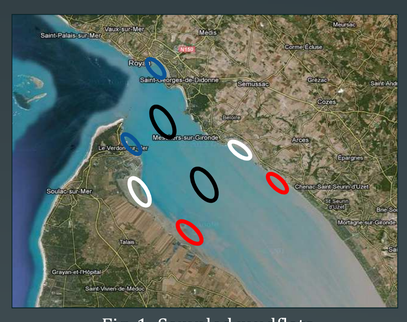


Fig. 1: Sampled mudflats

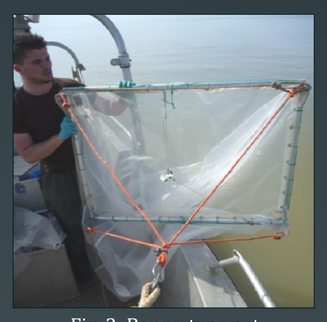


Fig. 2: Bongo-type net

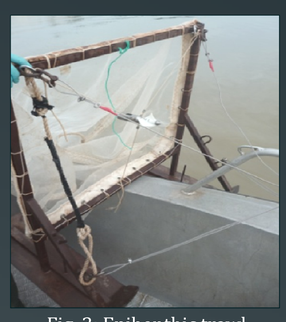
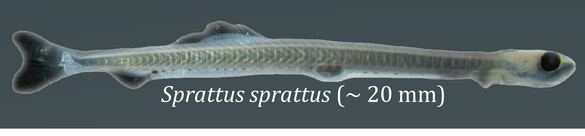


Fig. 3: Epibenthic trawl

Identification



Sprattus sprattus (~ 20 mm)

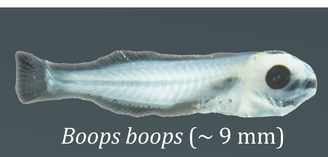
Merlangius merlangus (~ 7 mm)

Morpho-anatomical approach: body shape, size, pigmentation, number of fin rays, gut style.

Solea solea (~ 9 mm)

Dicentrarchus sp. (~ 15 mm)

Platichthys flesus (~ 8 mm)

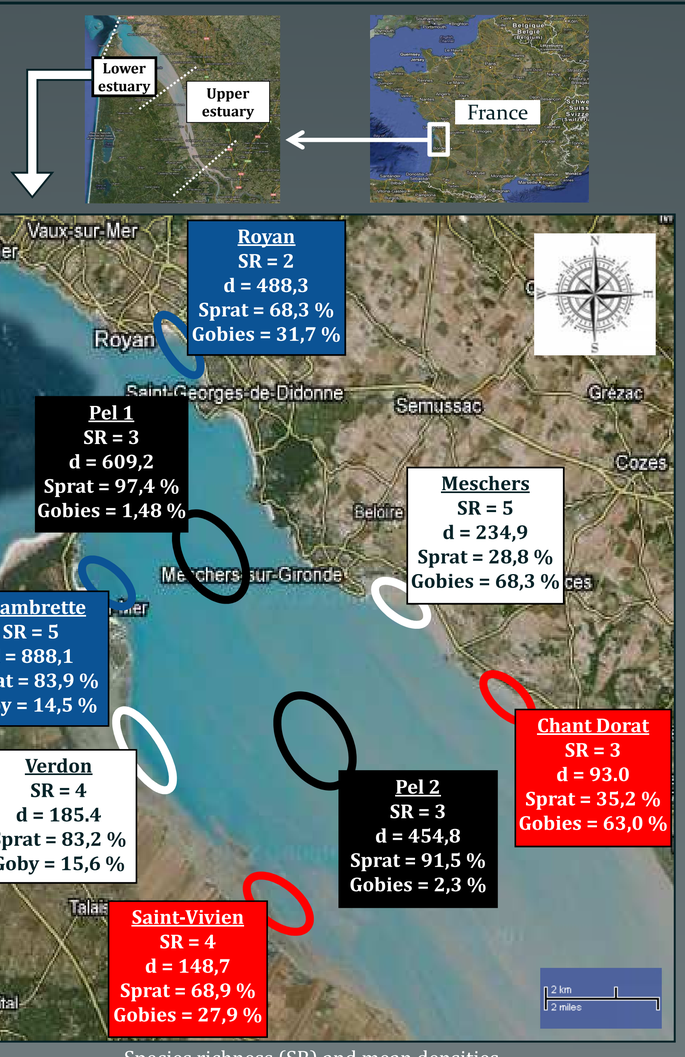


Boops boops (~ 9 mm)

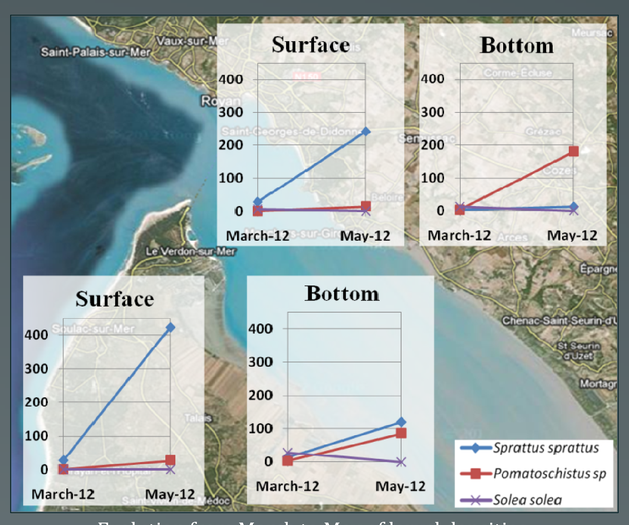
First results

Species caught	Abundances		Contributions (%)	
	March	May	March	May
Sprat (*Sprattus sprattus*)	137	1193	**48,9**	**65,1**
Gobies (*Pomatoschistus sp.*)	9	317	**4**	**33,3**
Dover sole (*Solea solea*)	81	0	**35,5**	**0**
Flounder (*Platichthys flesus*)	10	0	4,4	0
Whiting (*Merlangius merlangus*)	7	0	2,7	0
Lesser sand-eel (*Ammodytes tobianus*)	11	1	1,9	0,1
Plaice (*Pleuronectes platessa*)	3	0	1,3	0
Sea bream (*Sparus aurata*)	3	0	1,3	0
European eel (*Anguilla anguilla*)	2	1	0,7	0,1
Bib (*Trisopterus luscus*)	1	0	0,7	0
Sea bass (*Dicentrarchus sp.*)	0	3	0	0,4
Garfish (*Belone belone*)	0	3	0	0,4
Bogue (*Boops boops*)	0	9	0	0,3
Solenette *(Buglossidium luteum)*	0	4	0	0,1

➢ **14 species were identified. Sprats, Gobies and Dover soles mainly contribute to the total of individuals captured .**



Species richness (SR) and mean densities (d = number of animals / 1000 m^3) observed in May



Evolution from March to May of larval densities (d = number of animals / 1000 m^3)on each bank of the Gironde estuary at the surface and at the bottom of the water column

➢ **In May as in March, greatest species richness and highest densities on the left shore, and especially for the sampling site called "La Chambrette".**

➢ **High densities observed in "Pel 1" and "Pel 2" off the mudflats.**

➢ **On the left shore as on the right shore Sprats (*Sprattus sprattus*) are mainly captured at the surface of the water column whereas gobies (*Pomatoschistus sp.*) are mainly captured on the bottom.**

➢ **Larval densities significantly higher in May than in March.**

Conclusion

➢ **Lateral distribution: left shore shows higher larvae densities;**
➢ **Vertical distribution: pelagic fish larvae dominated by sprat mainly found at the surface while benthic fish larvae mainly found on the bottom.**
➢ **No significative differences were observed in the size spectrum of the fish larvae between upper and lower sampling sites.**

Perspectives

➢ **This study is ongoing. Surveys planned in summer will provide more information in particular regarding the mechanisms of colonization.**
➢ **Possible future studies could focus on a behavioral approach and investigate the biological mechanisms (swimming capacity, sensory mechanisms) influencing colonization of the estuary by marine fish larvae.**

Unité de recherche EPBX
IRSTEA - Centre de BORDEAUX
50 av. de Verdun
33612 CESTAS GAZINET, FRANCE
www.irstea.fr

36th Annual Larval Fish Conference - 2 – 6 July 2012 - Bergen – Norway

* Corresponding author : Mario.Lepage@irstea.fr