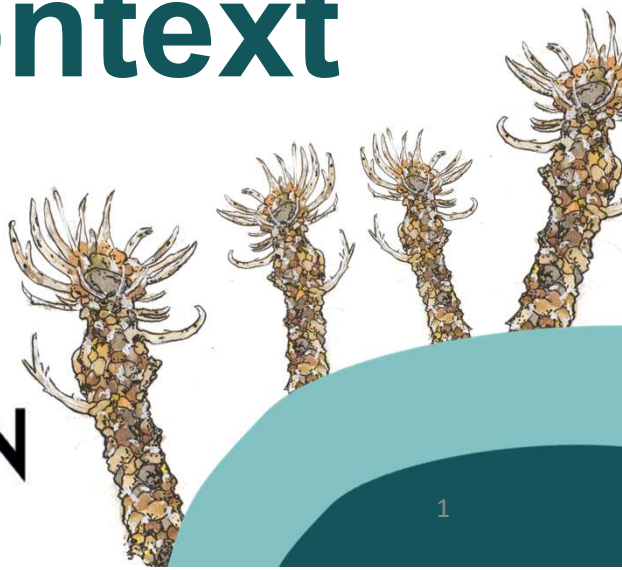
# *Lanice conchilega* (Polychaeta) in a coastal defence context

Alexia Semeraro, Liam Wyns, Alice D'Hurlaborde, Gert Van Hoey

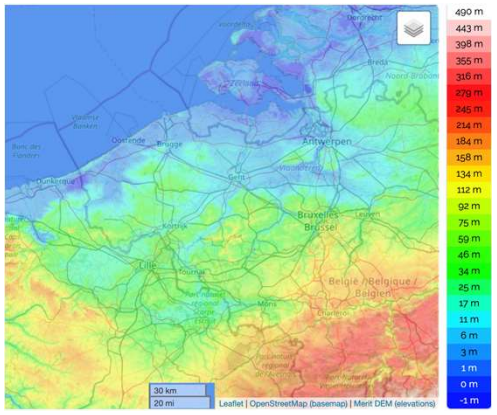


# Introduction

Coastbusters

**Coastal area have a high socio-economic value**

**Coastal erosion is a rising threat**




**Belgium coastline is very vulnerable**

# *Lanice conchilega* restoration

Annelida

Polychaeta

Terebellida

Terebellidae

*Lanice*

***Lanice conchilega***

## *What?*

- ***Tube building, habitat structuring species***
- ***Abundantly present in North Sea***
- ***Eco-engineer (increasing biodiversity), creating elevated sediment spots (stabilize sediments)***

# *Lanice conchilega* restoration

Annelida

Polychaeta

Terebellida

Terebellidae

*Lanice*

***Lanice conchilega***

***Aspects to tackle:***

- ***Enhancing their occurrence (larval cultivation?)***
- ***To be attracted to the right spots (use of artificial substrates?)***
- ***Evolution of their occurrence and patchiness***

# *Lanice conchilega* restoration

Annelida

Polychaeta

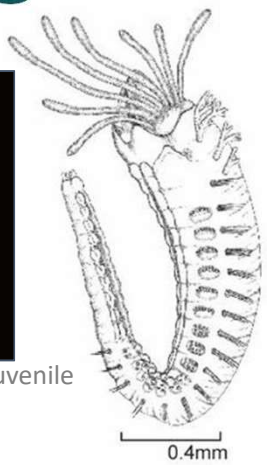
Terebellida

Terebellidae

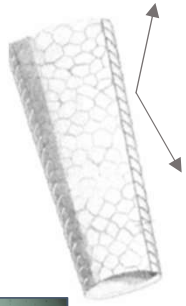
*Lanice*

***Lanice conchilega***

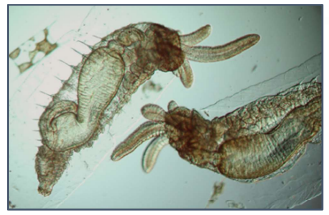
Juvenile

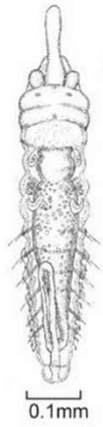



1-3 years

Tube



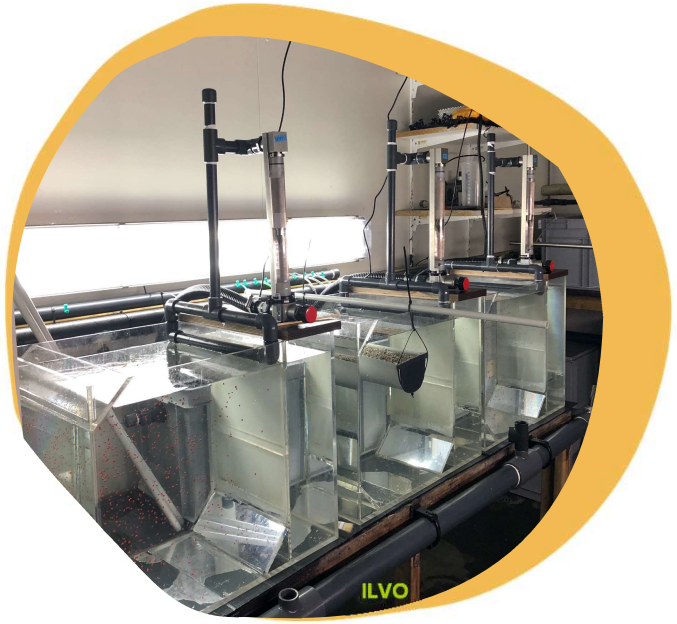



Aulophore

# *Lanice conchilega* restoration

## *Lanice conchilega*

An ecosystem engineer providing coastal protection




## Laboratory set-up

An optimized set-up and experimental design allowing screening of multiple artificial substrates

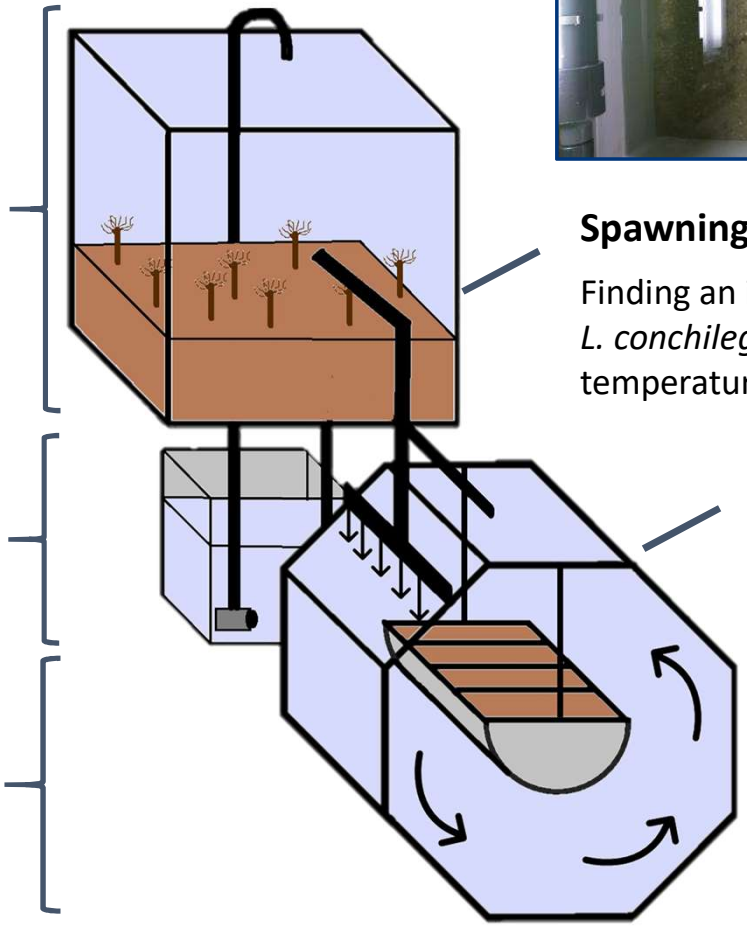

# Spawning experiments for screening purposes

WYNS L. et al.(published 2020)


Adult tube worm tank

Biofilter section

Kreisel section



## Spawning induction

Finding an improved protocol for spawning induction of *in vitro* *L. conchilega* adults by combining different light and temperature conditions

## Substrate settlement

To reveal what type of substrate is preferred as a holdfast by *in vitro* kept aulophore larvae of *L. conchilega* during benthic settlement


**Acclimatisation period**

**Transition period**

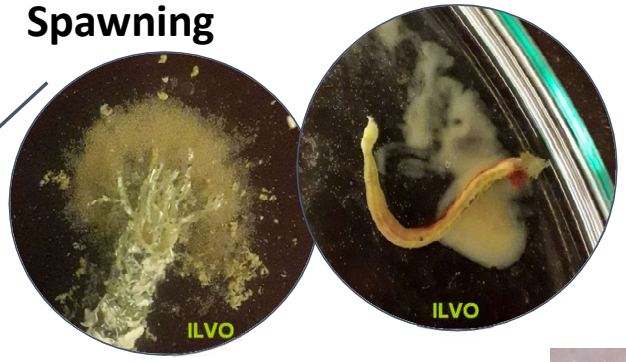
**New conditions**

Trial 1 → Trial 2 → Trial 3

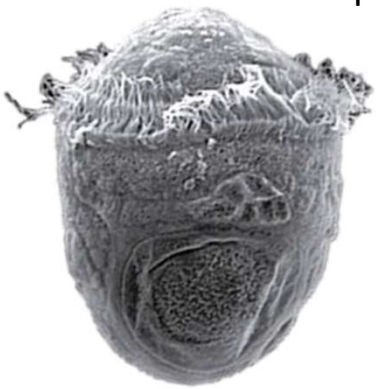
BE Heist
Sampled in winter
No spawning

FR Boulogne
Sampled in March
No spawning

FR Boulogne
Sampled in April
**Spawning**




Trochophore



- Spawning
- Fertilization
- Trochophores (over 60 000)

T↑

24:0 LD | 16:8 LD | 0:24 LD

? ? ✓

After 23 days

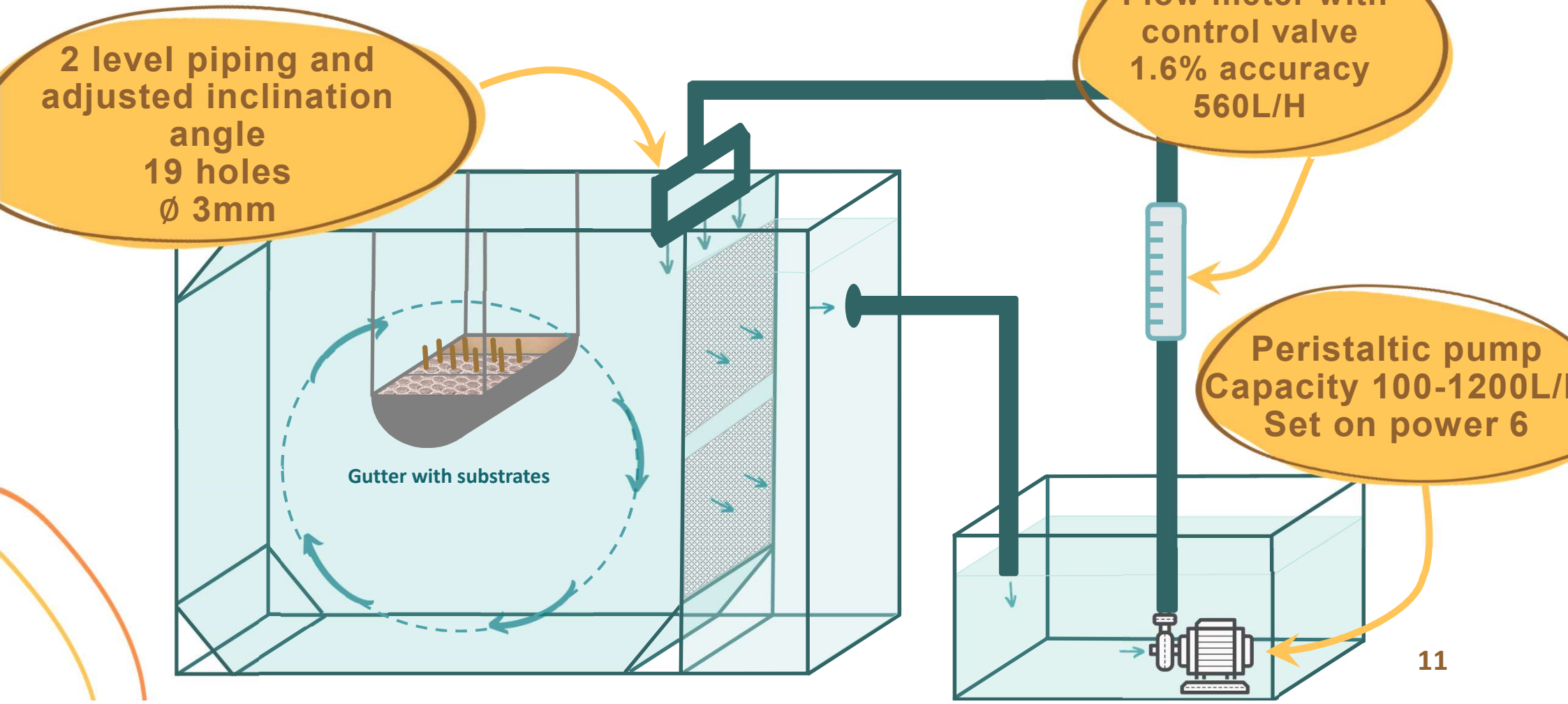
No spawn


Spawn

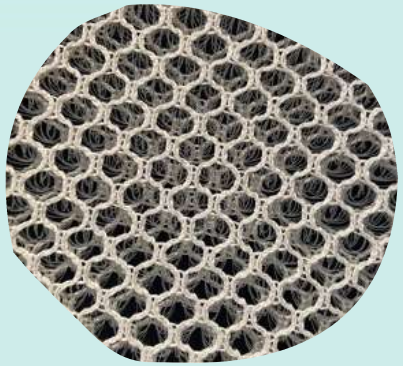

# Screening of artificial substrates for coastal defence

D'HURLABORDE A. (unpublished 2021)

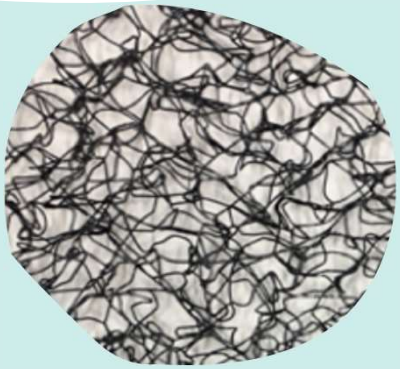
# The optimal set-up



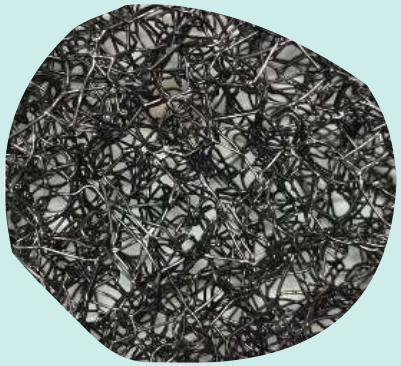
# Artificial substrates



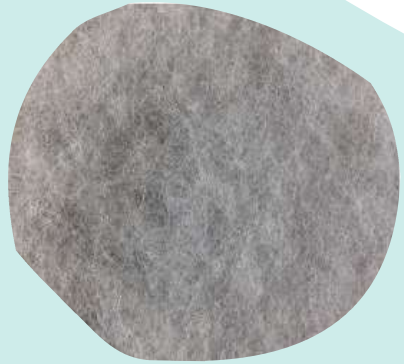
A) geotextile (220 g/m2 3D knitted fabric (10 mm thickness) based on PES knit and PA spacers)



B) geotextile Kena260 black non-woven (260 g/m2)



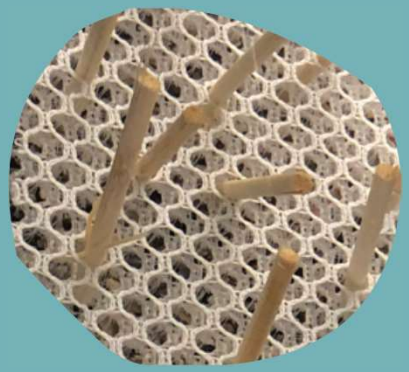
C) 3 layer of geotextile Kena260 black non-woven (260 g/m2)



D) geotextile NW170 White non-woven (170 g/m2)

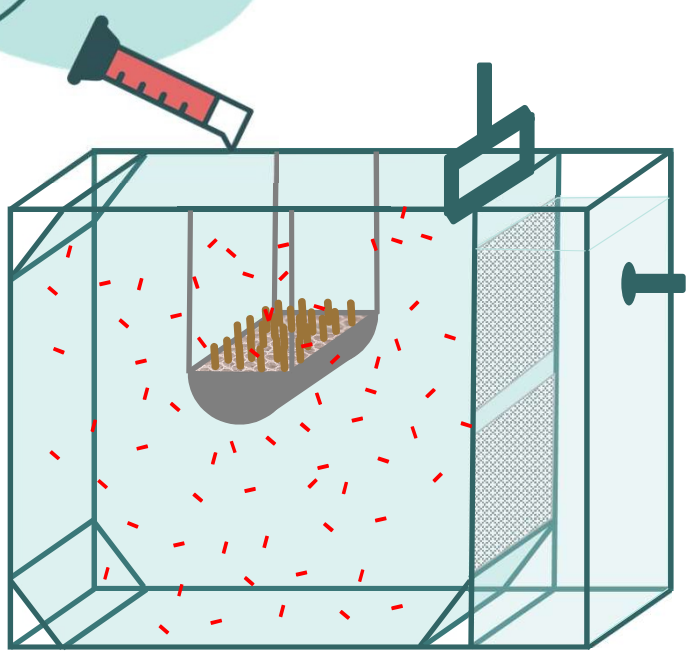
E) Control: Fine shell fragment or fine sand

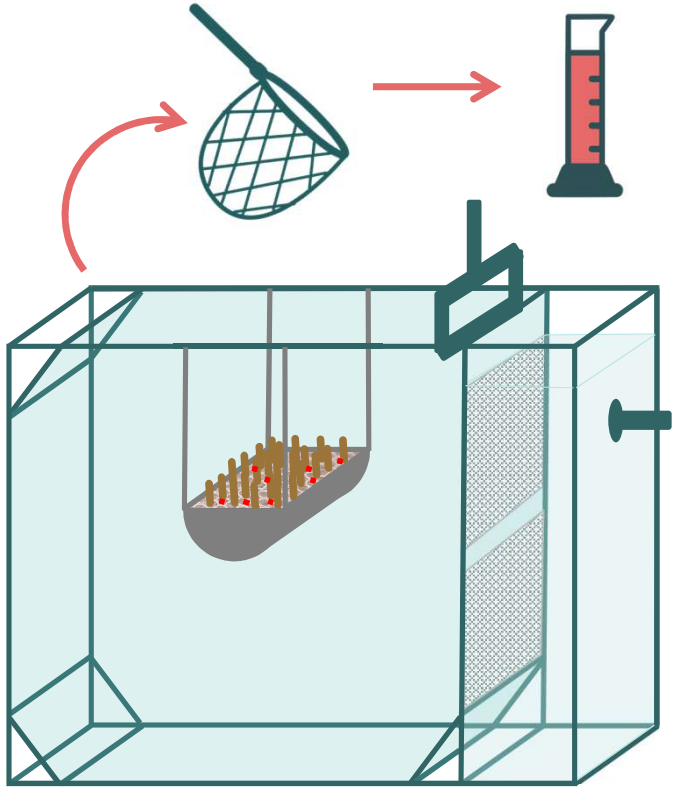
F) Wooden sticks (density 680tube/m2 ) in substrate E



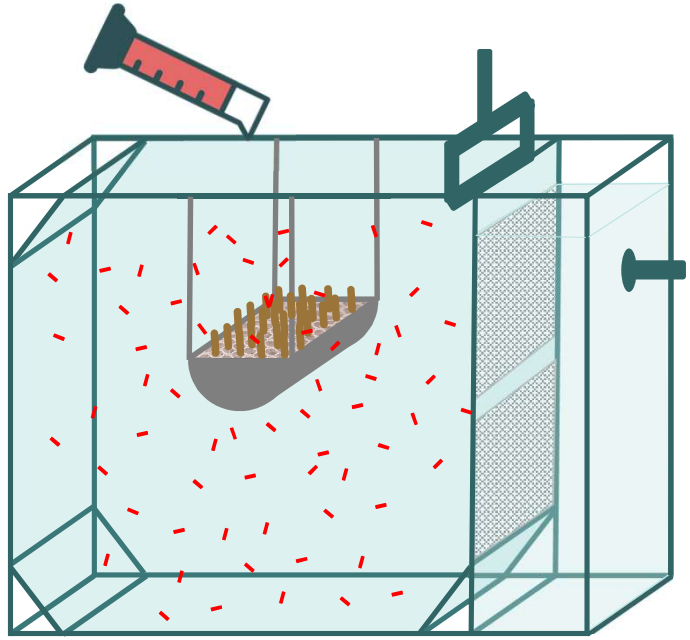
G) Wooden sticks (density 680tube/m2 ) in substrate A

H) Wooden sticks (density 680tube/m2 ) in substrate B



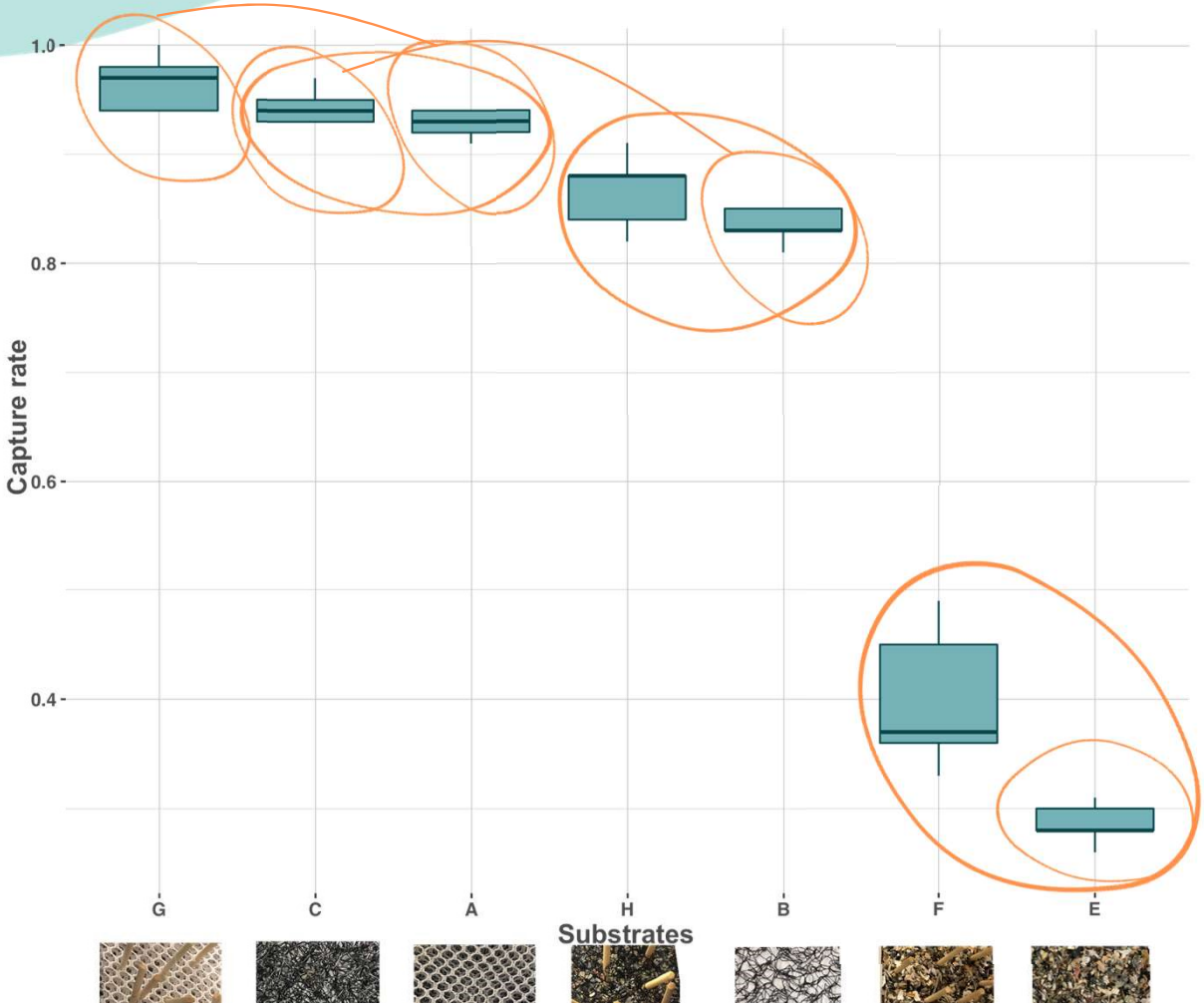


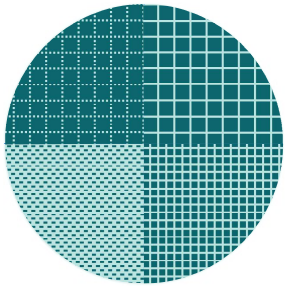
5 min



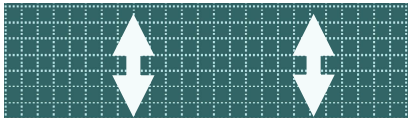
# 01 Capture rate

# Identification by pellet capture rate

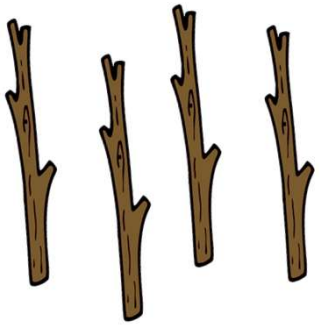


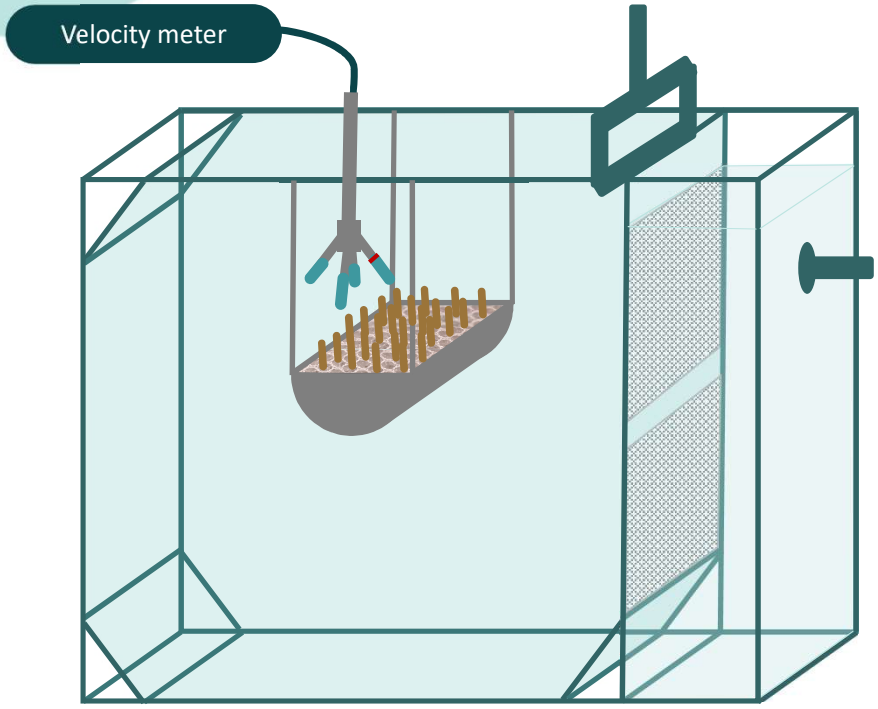
Mesh size

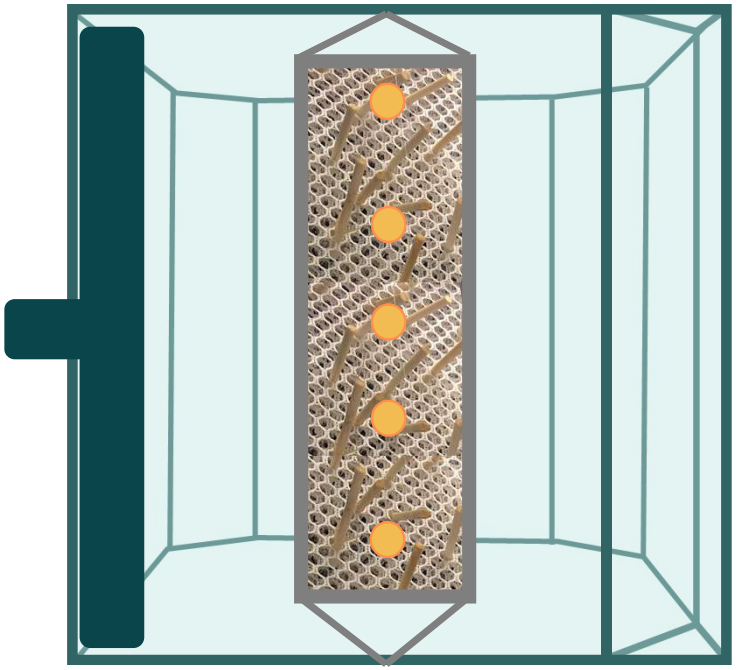


Geotextile thickness



Wooden sticks

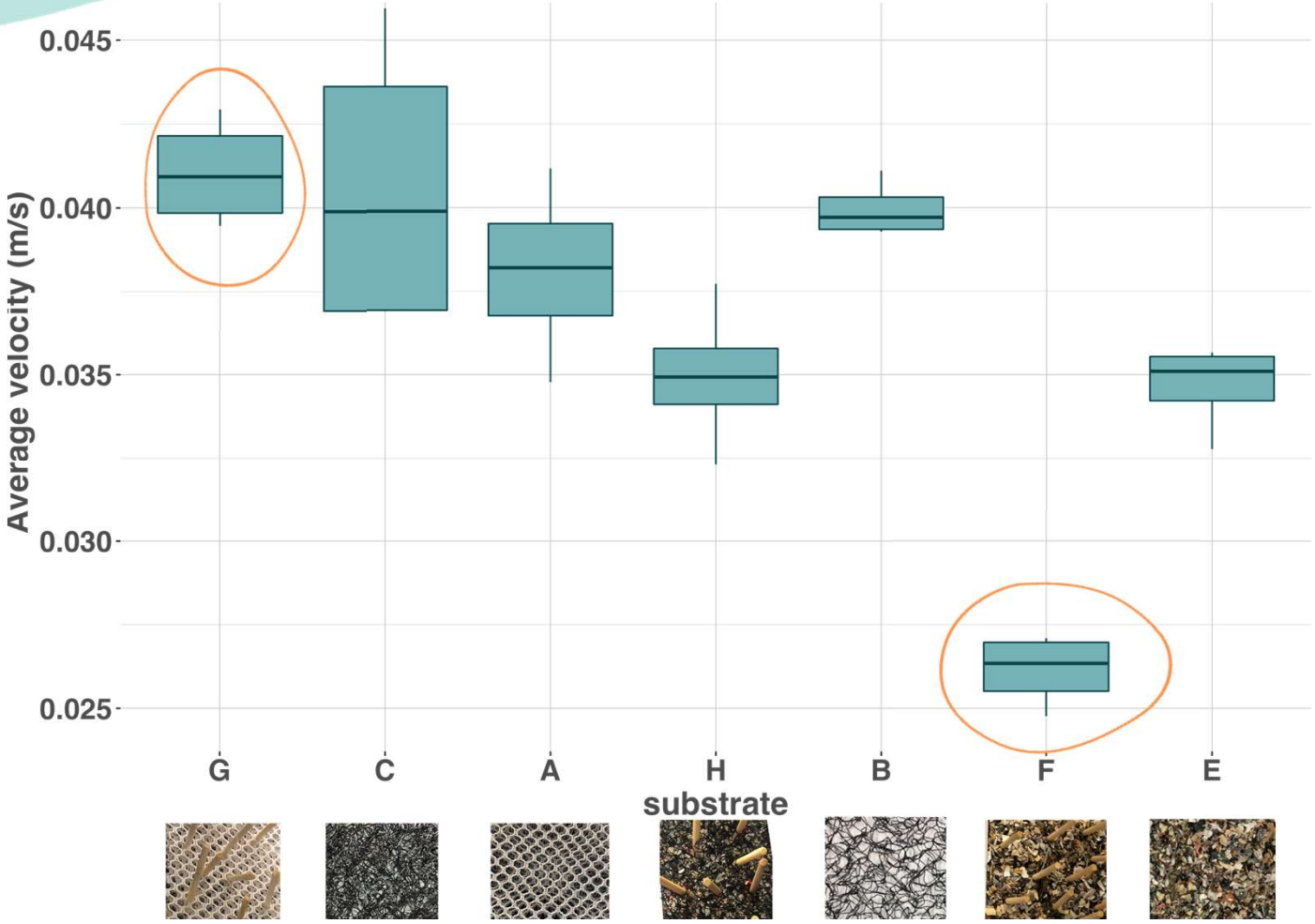


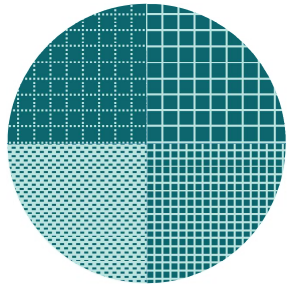



Average velocity above gutter

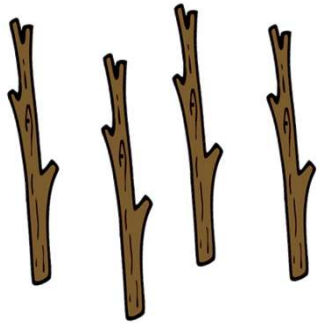
# 02 Flow velocity disturbance

# Identification by flow velocity

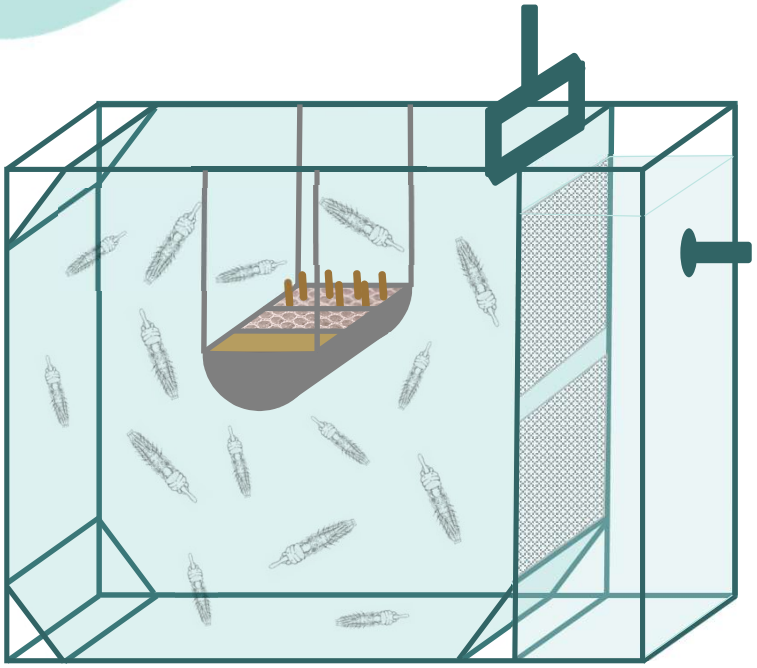


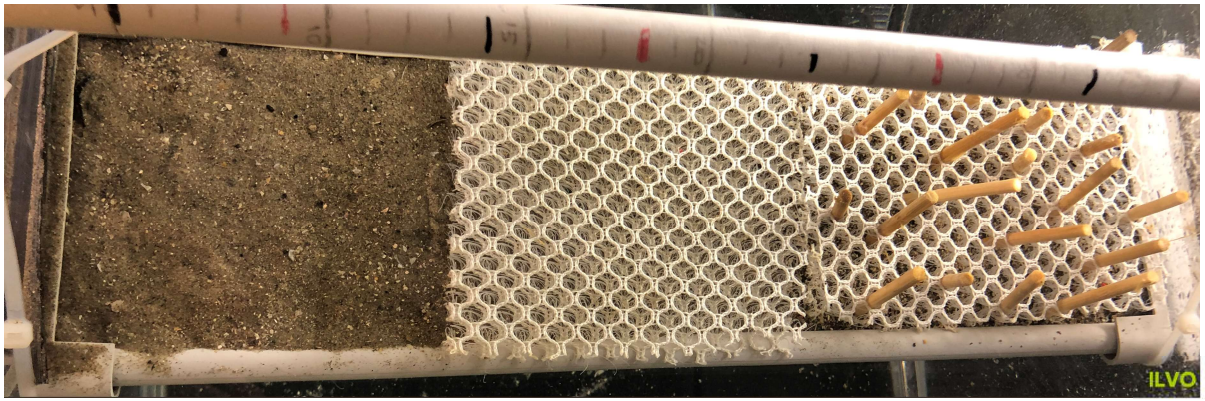



Geotextile tend to increase overlaying flow velocity



Sticks tend to decrease flow velocity






**Randomization of position in the 3 replicas**

# 03 Larvae settlement enhancement

# Identification by larvae settlement

WYNS L. et al.(published 2020)

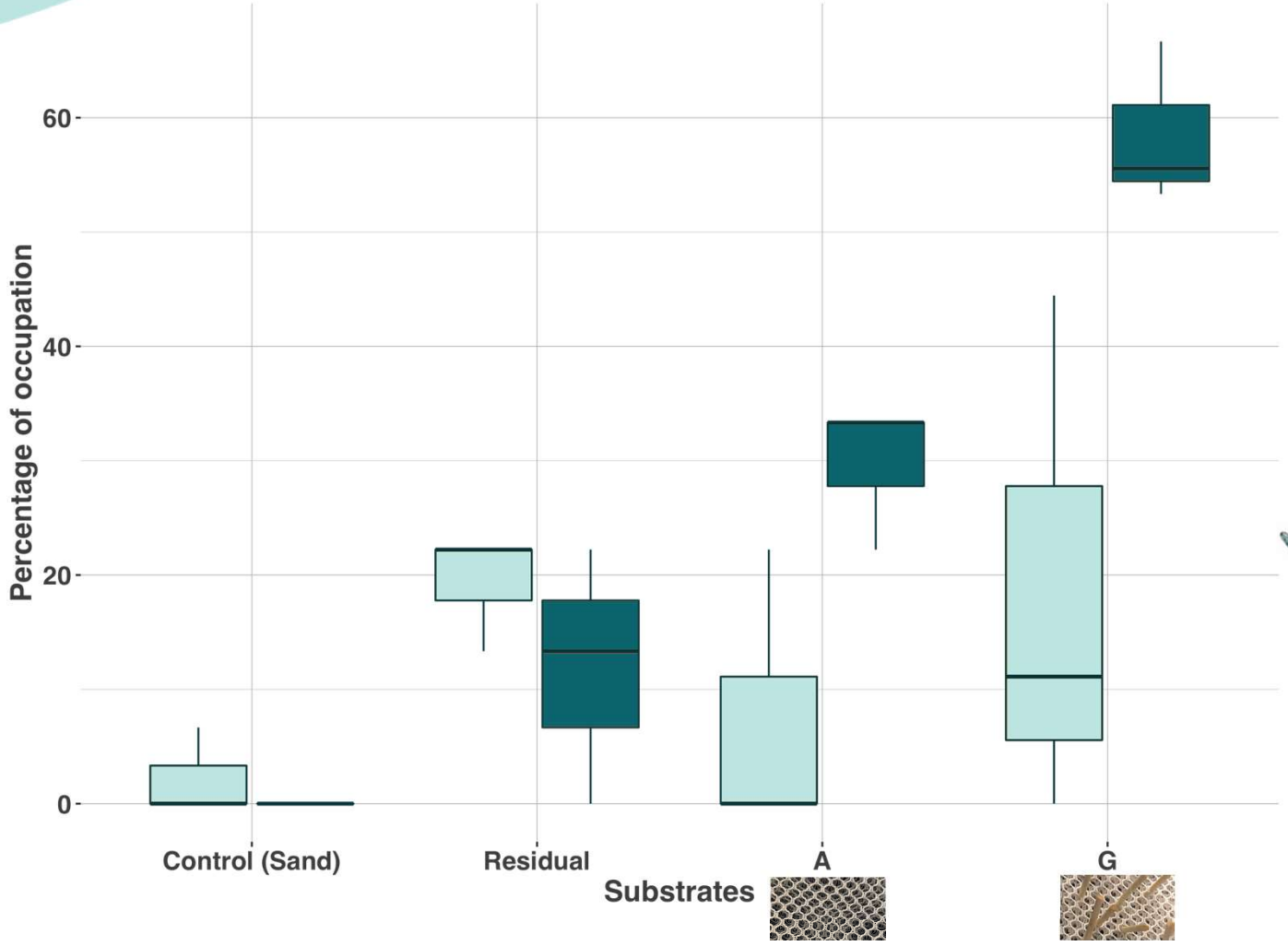


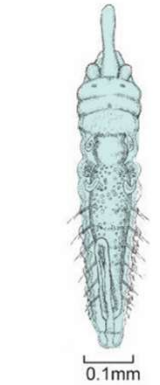
geotextile NW170 White non-woven (170 g/m2)

**White dense substrate seems enhancing the most settlement rate in lab conditions.**

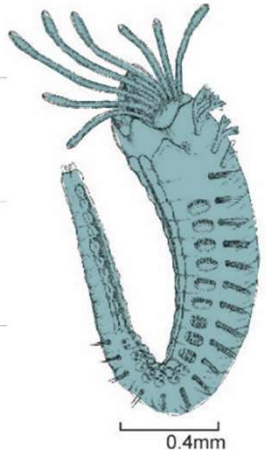
# Identification by larvae settlement

D'HURLABORDE A. (unpublished 2021)




Pelagic

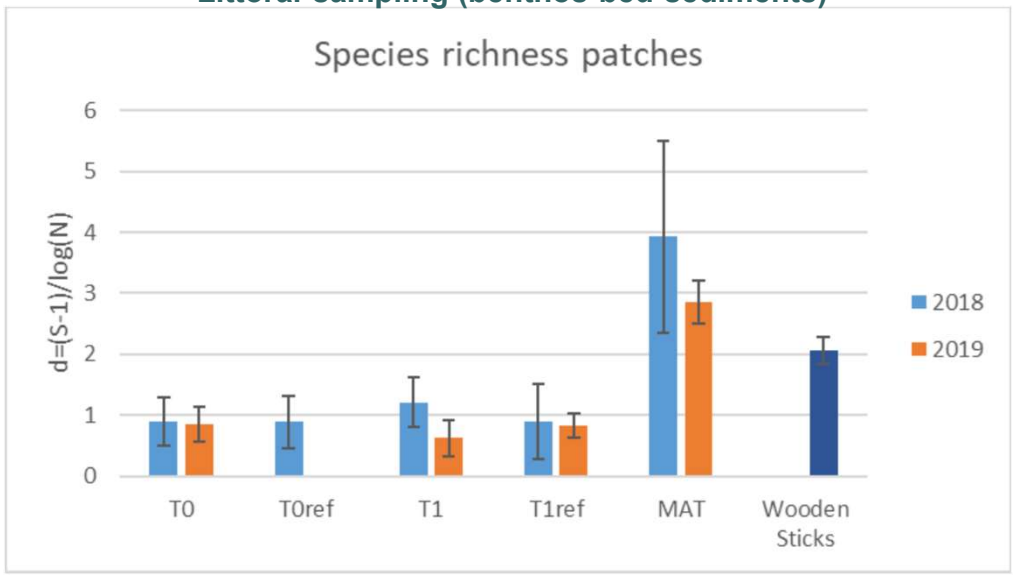



Benthic

# Substrates in the field
# Enhancing a reef

SEMERARO A. (published 2020 - ILVO)


**Littoral sampling (benthos-bed sediments)**







**Check Lanice attraction & settlement succes rate**

Two test sites (open beach – protected bay) - Patches of 5 $m^2$




# Thanks for your attention

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You want to join us?
Contact us!