Marine Wood Borers Pest Management using a Plastic Coating

Practical Case in the Fishing Museum of Palamós

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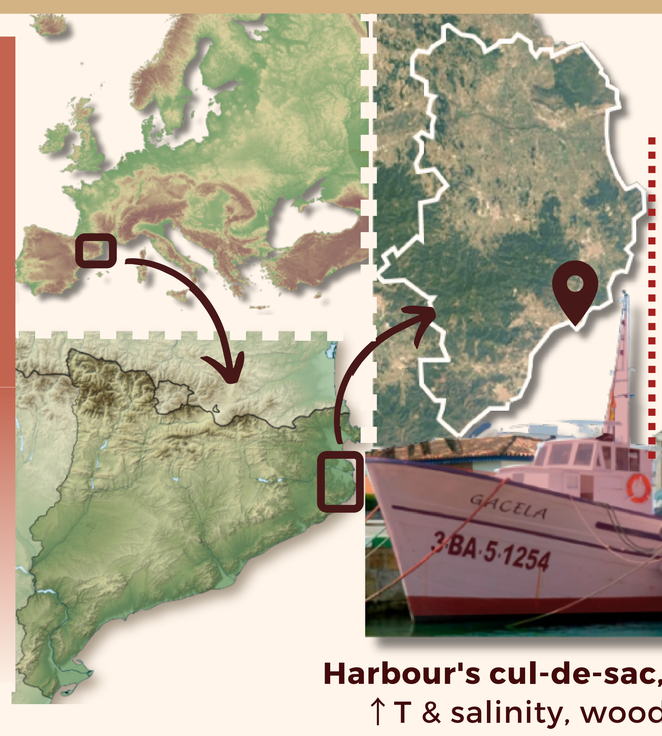
UAB [ApS]

Museu de la Pesca

CONTEXT



Gacela

Fishing Museum (Tinglado building)

Estrella Polar

Harbour's cul-de-sac, ↓depth, N & SW wind
↑T & salinity, wood waste accummulation

Museum's floating exposition:
The Fishing Boats [1,2]

- Built in 1960.
- *Pinus pinea*, *Quercus* spp. & *Milicia excelsa* wood.
- 20.2 x 5.2 x 2.4 m.
- Dry dock every 4-5 years.
- Hull ↑↑ affected by the pest.

- Built in 1970.
- *Pinus pinea* & *Quercus spp.* wood.
- 14.7 x 5.13 x 1.5 m.
- Dry dock every 2-3 years.
- Hull ↓↓ affected by the pest.

60% of hull reparations are associated with Marine Wood Borer damage

AIM

Elaborate a Pest Management Proposal within the Integrated Pest Management framework, keeping:

- **The boats in the water.**
- **The boats in their harbour location.**
- **Their dry dock mantainance frequency.**
- **Their original construction material.**

How?

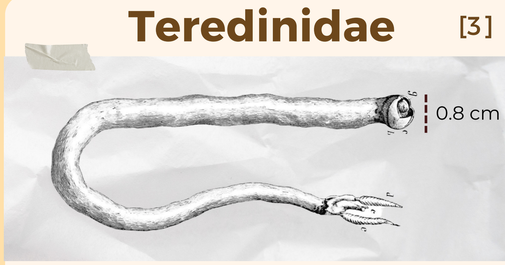
Bibliographic research, contact & meetings with other European entities & researchers.

Pest

Community of xylophage marine species community that create tunnels within wood. Generally adapted to warm saltwater. **Palamós Research Proposal.**

MOLLUSCA

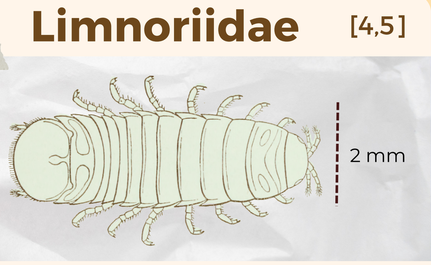
Teredinidae [3]



- Larval dispersal stage, modified adult form.
- ↑ distributed, 8 spp. in the Mediterranean Sea.
- Most known sp.: *Teredo navalis*.
- Δ T & salinity range.
- ↑ impact on wood.

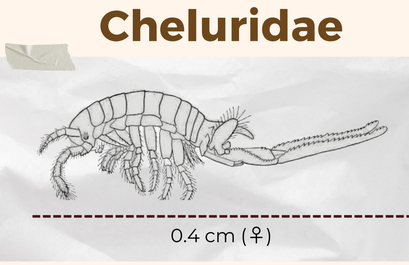
CRUSTACEA

Limnoriidae [4,5]



- Adult dispersal stage.
- 2 *Lymnoria* spp. in the Mediterranean Sea:
  - *L. tripunctata*
  - *L. quadripunctata*
- ↑ T & salinity range.
- ↑ impact on wood.

Cheluridae [6]



- Adult dispersal & colonising stage.
- 1 sp. in the Mediterranean sea: *Chelura terebrans*.
- ↑ T & salinity range.
- *Lymnoria* spp. comensal → ↓ impact on wood.

RESULTS

PROPOSTA DE GESTIÓ DE LA COMUNITAT DE CORCS MARINS A LES BARQUES DEL PEIX DEL MUSEU DE LA PESCA (PALAMÓS)

Museu de la Pesca
PALAMÓS COSTA BRAVA

FUNDACIÓ PROMEDITERRÀNIA

Maig de 2023

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- Reduce Marine Wood Borer damage to **10 - 15%** of total hull reparations.
- Tolerance threshold established for the sightning of **a single organism** or **signs of their presence**.
- Measures expected to come into effect by the end of 2023.

Management method

Hull underbody covering (+0.5 m) with a **plastic coating**, using:

Option 1 | Polyethylene membrane:
- Preventive management: impermeability to marine borers. [7,8]
- Active management: H_2O impermeability (anoxic conditions).
- ~ tear resistant.
- Cheap, 105€ in total.

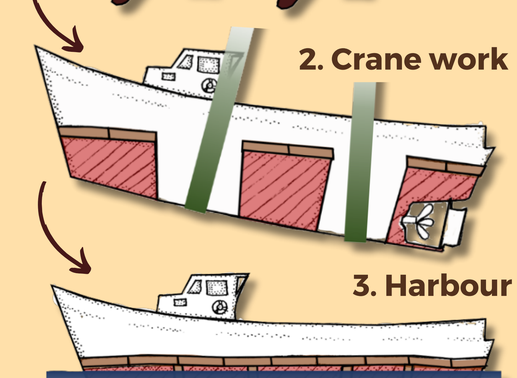
Option 2 | Geotextile: [7,9]
- Preventive management.
- ~~Active management.~~
- ↑ tear resistant.
- ~ cheap, 255€ in total.

Option 3 | Multilayer fabric:
- Polyethylene membrane (inner layer) & geotextile (external layer).
- Preventive management.
- Active management.
- ↑ tear resistant, reinforced structure.
- ↓ cheap, 360€ in total.

Use of submergible adhesive material & wood slats for tight coverage

Application

Op. 1 & 3: dry dock or **hybrid application.**
Op. 2: dry dock.



Plastic coating (red) & **wood slats** (light brown) are placed in the **bow**, **stern** and the **hull central area**, leaving sections with support structures (dark brown) free.

The boat is taken into water placing **slings** (in green) in the **plastic coating-free sections**, avoding damage in protected hull areas.

Plastic coating left is applied in water, placing **wood slots** between sections to garantee no areas are exposted to water & consolidate the structure. A **water extractor pump** should be used & installed.

Repeat every time boats are taken to dry dock.
2-3 people team, ~**5h work**.
Monitoring Plan:
- Based on EN 275:1992.
- Mensual revision.
- Run previous pilot tests.

Possible changes in the long term.

References & Image Sources

DISCUSSION

Option 1 has been received as potentially effective & practical by the entity.

Marine wood borers should be more known in the Pest Management sector.

More research is needed into:
- **Identifying populations in Western coasts of the Mediterranean Sea.**
- **Finding more effective, cheap & sustainable management options.**