

Biofouling in seaweed farming: Challenges and solutions

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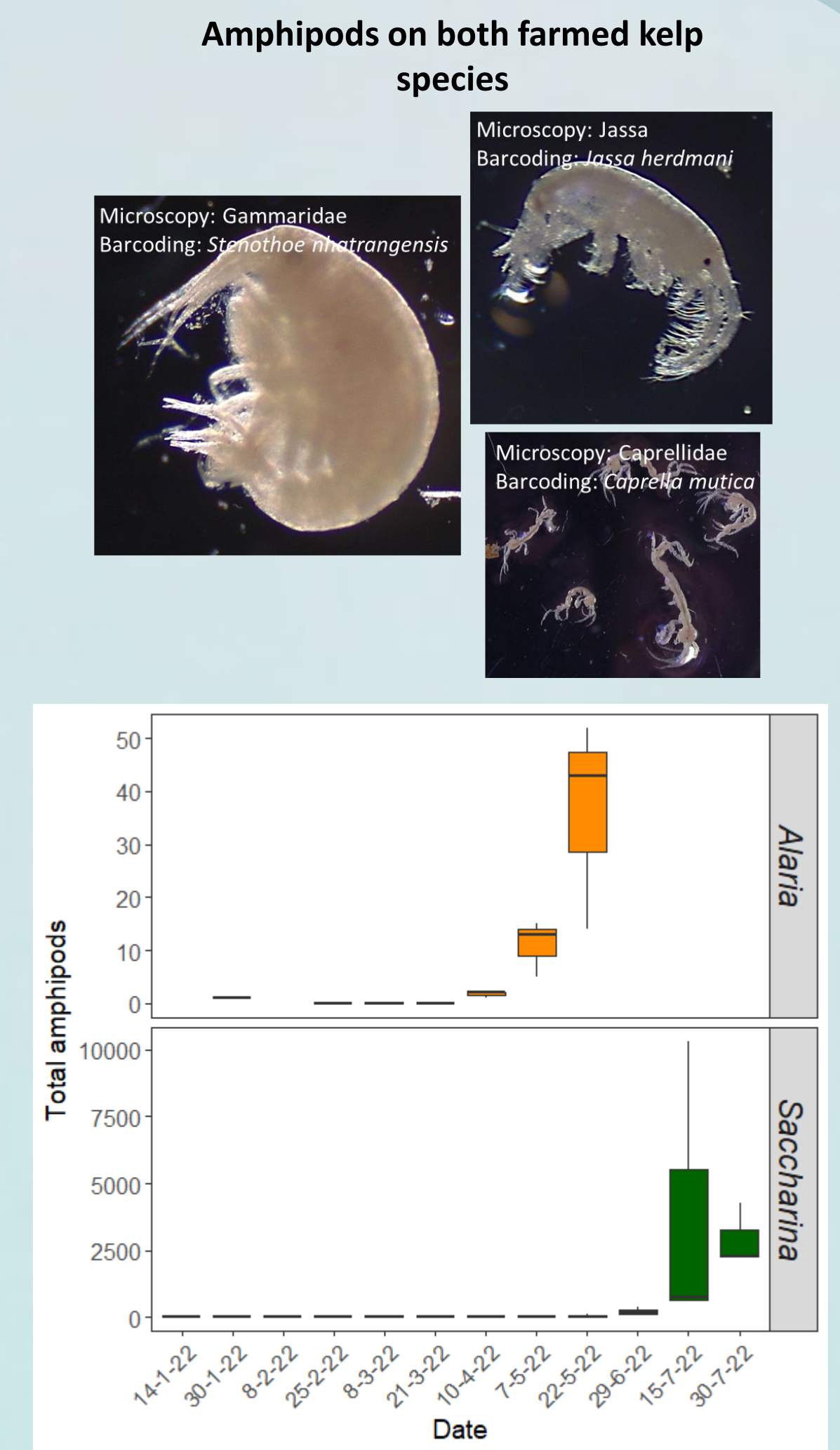
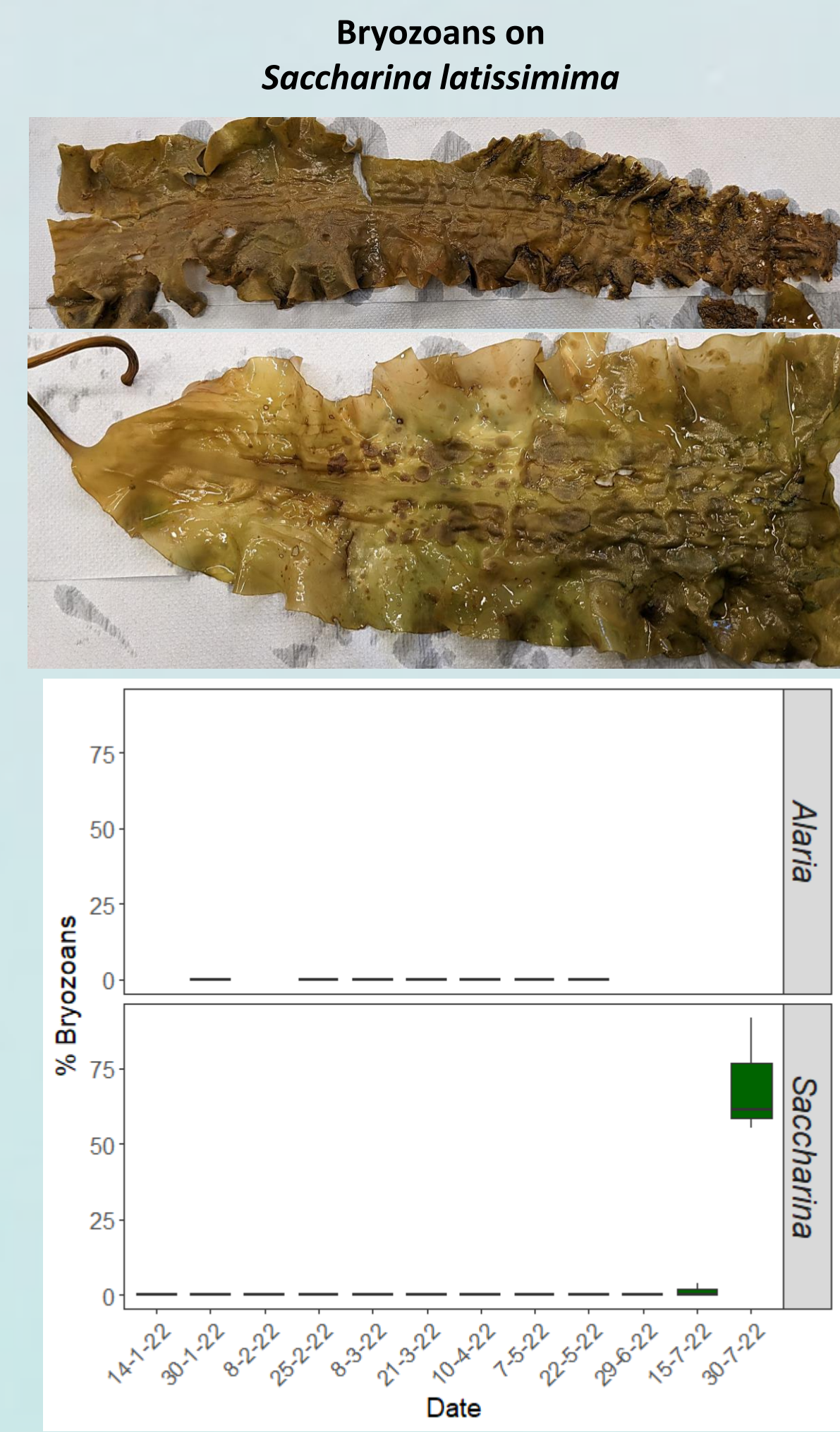
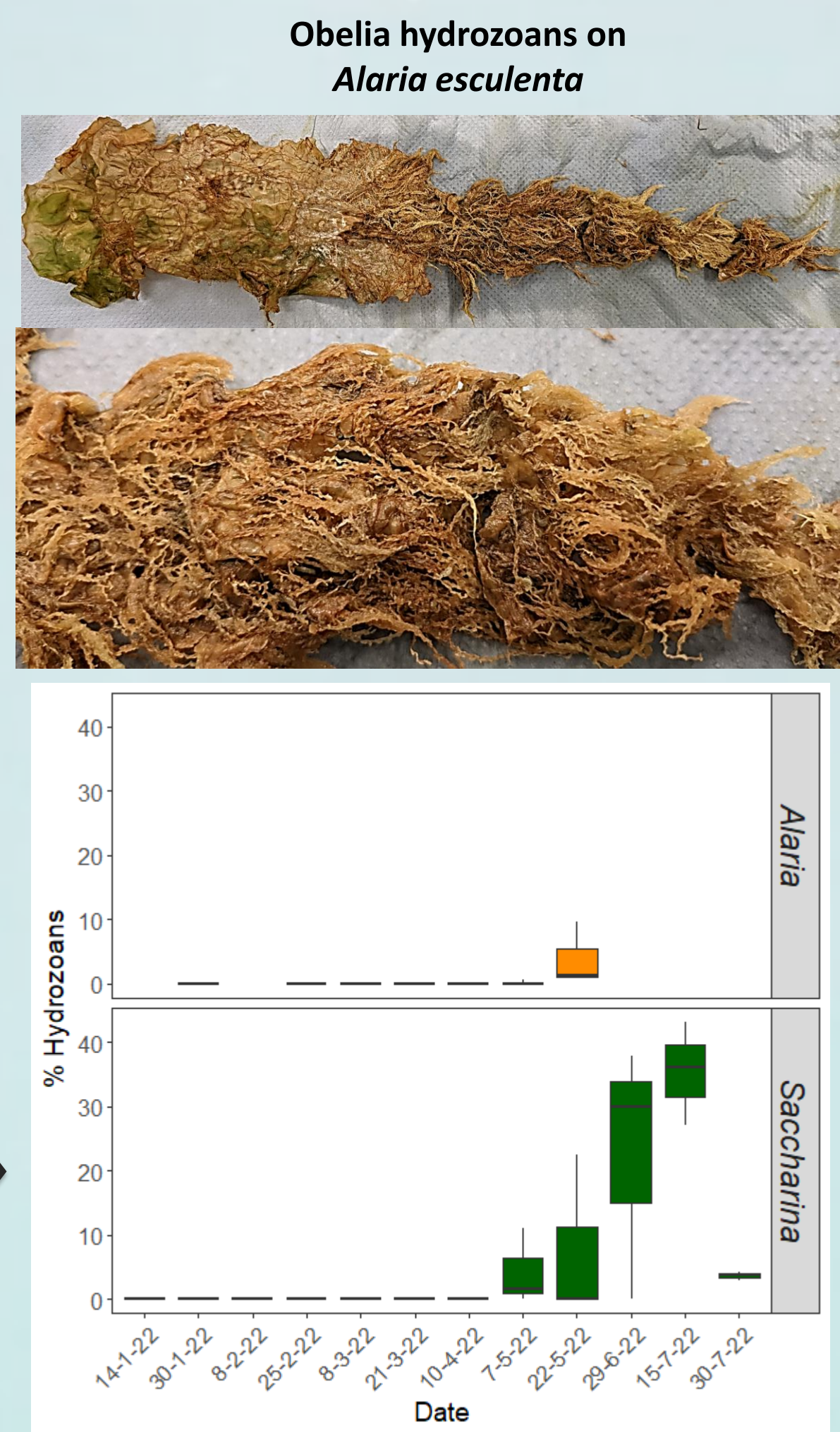
ASLO Aquatic Sciences Meeting 2023
 4-9 June 2023 · Palma de Mallorca, Spain

abstract number: 4860

Layout picture: Kelp forest bathing in the sunlight @Shutterstock

The problem

- ✓ Biofouling epibionts are limiting the expansion of kelp farming in the NE Atlantic coasts.
- ✓ Biofouling hydrozoans, bryozoans, bivalves, crustaceans, gastropods, and epiphytic algae, result in increased processing costs, decreased product value and allergen risks.
- ✓ Here you can see the progress of biofouling from our monitoring of a production cycle of *Alaria* and *Saccharina* kelp from our collaborator kelp farm (KelpCrofters LTD) in the west Scottish coast.



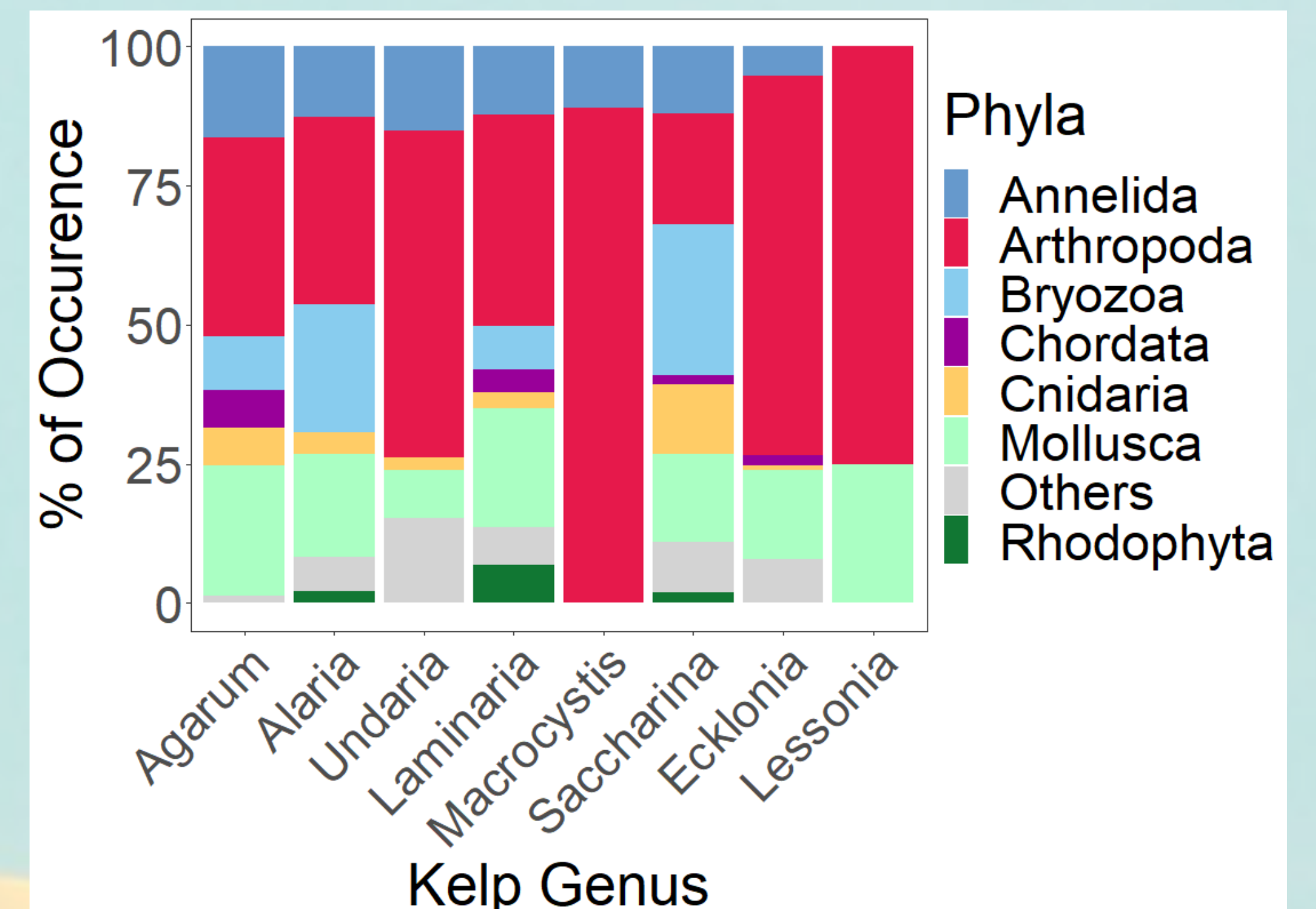
What we need to know

- ? WHEN do epibionts appear in the plankton and how long it takes to settle on the kelp fronds – this will help farm time harvesting
- ? WHERE are epibionts more dominant locally (e.g. by depth)
- ? Can eDNA monitoring detect epibionts in the plankton earlier than microscopy – thus acting as a more efficient early warning system
- ? WHERE are epibionts more likely to occur wrt e.g. latitude and hydrology

What we know from our literature review

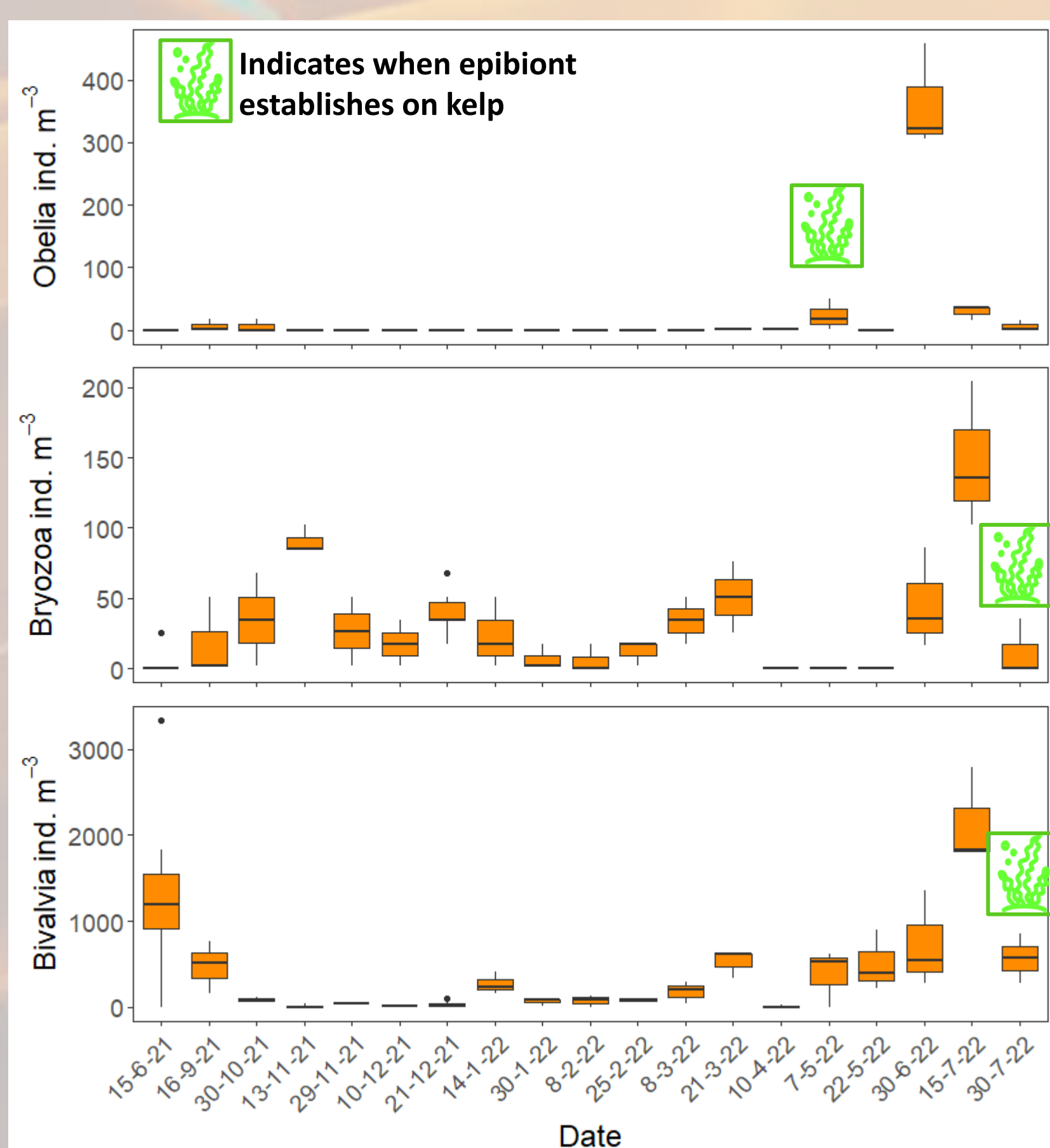


Our review of papers on macroalgae biofouling communities: 53 macroalgae publications > 25 on kelp > 94 locations mainly NE Atlantic coast



Based on these 25 kelp studies we know the relative dominance of epibionts on different kelp species BUT we still don't know where these are most likely to occur in time or by depth, latitude and hydrodynamic conditions

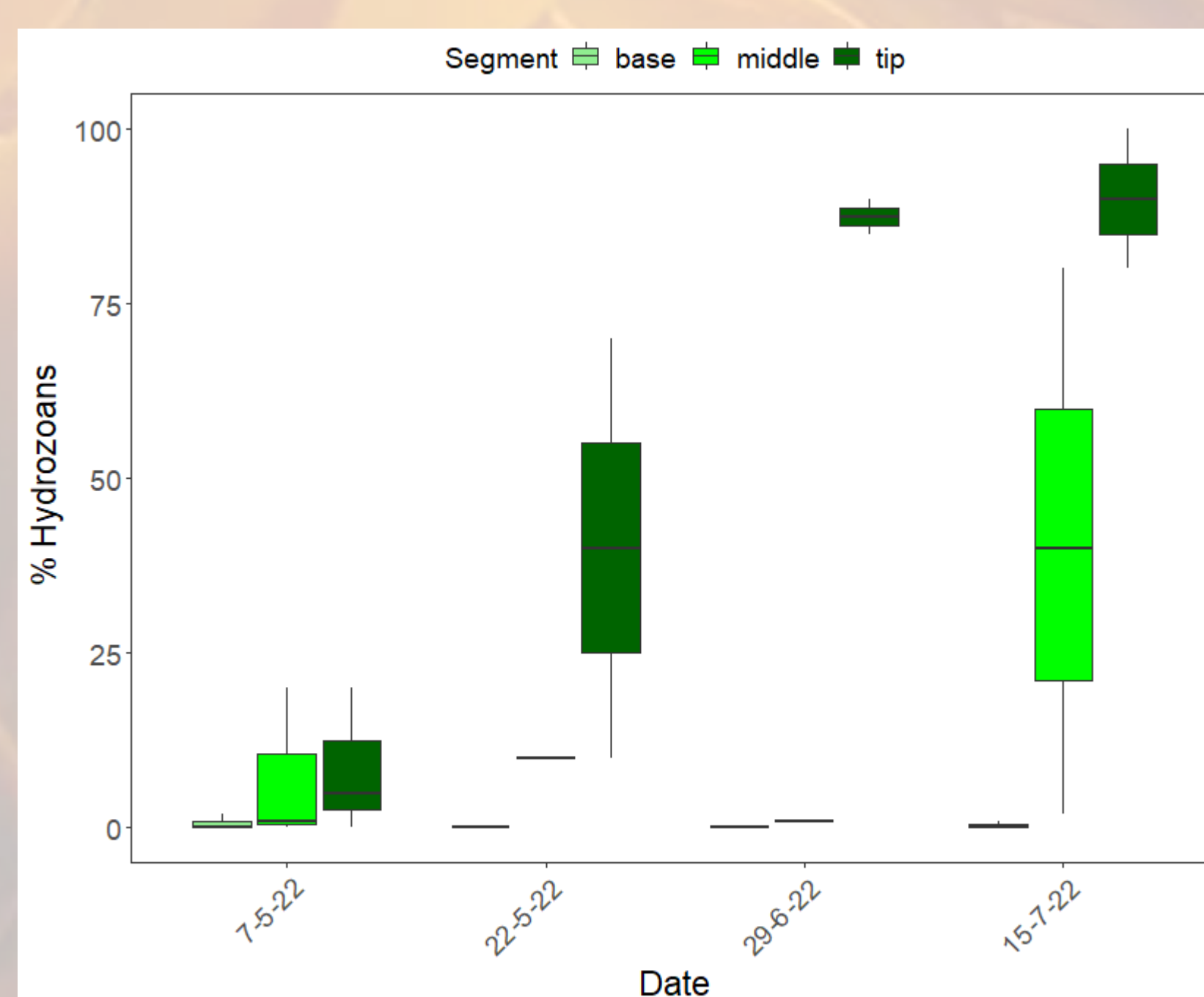
WHEN epibionts appear in the plankton



Main Kelp biofouling epibionts recorded in the plankton and when these established visibly on the kelp fronds. Knowing this time window can help farms know when to harvest after the epibionts have appeared in the plankton

Solutions

WHERE are epibionts dominant locally



Hydrozoan epibionts abundance by part of the blade as a proxy of depth. Blade tip is deeper in the water column whereas base is where kelp is attached to the ropes that run horizontally through the farm.

In progress

- Use eDNA monitoring of epibionts in the plankton → Identify best time for harvesting before these appear on kelp fronds
- Use our compiled data from the literature review on kelp epibionts → Identify where are epibionts more likely to occur wrt hydrology and latitude

Final goal is to inform kelp farmers of:

- ✓ Suitable kelp species
- ✓ Best time windows for harvesting
- ✓ Spatial planning of farmed kelp
- ✓ Monitoring systems to have in place as early warning system

Stay tuned for our findings on eDNA monitoring of seaweed farms!

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