Wild *Undaria pinnatifida* from Golfo Nuevo (Patagonia, Argentina) as biomass feedstock for wakame, fucoidan and phenolic extract production.

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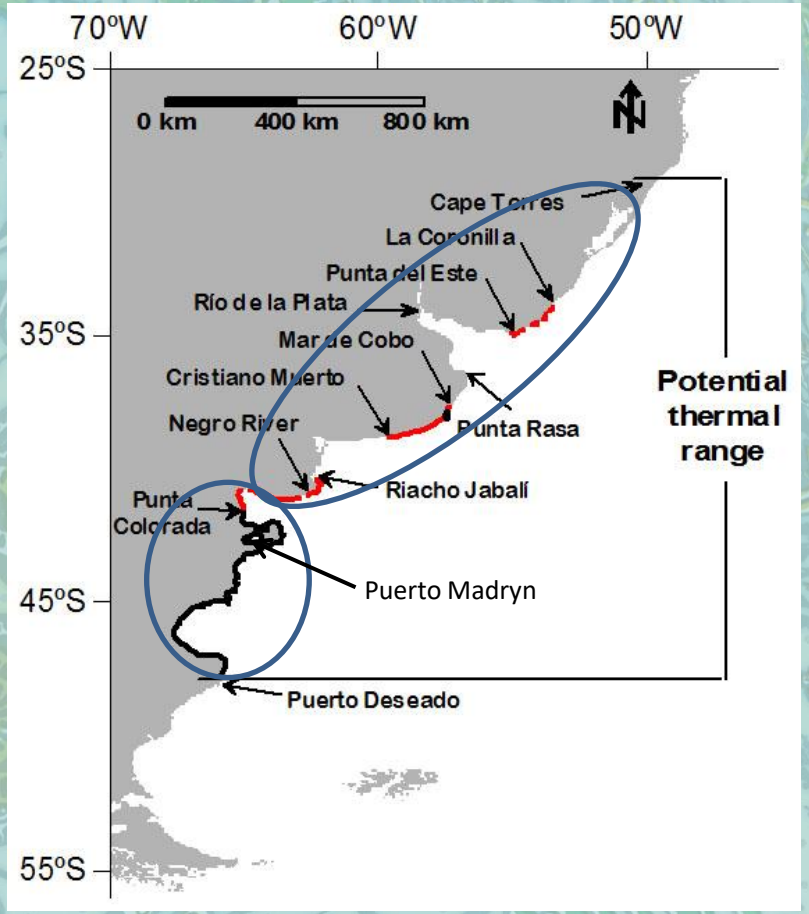
Undaria pinnatifida in the SW Atlantic coast



- Since 1996 in the SW Atlantic
- Spread over ~ 10 degrees of latitude in the Argentine coast
- In the north part of the range habitats are mostly unsuitable (exposed sandy beaches)
- In patagonia, sheltered rocky shores favor the establishment of *Undaria*

Dellatorre et al 2014. Potential range of *Undaria* in the SW Atlantic

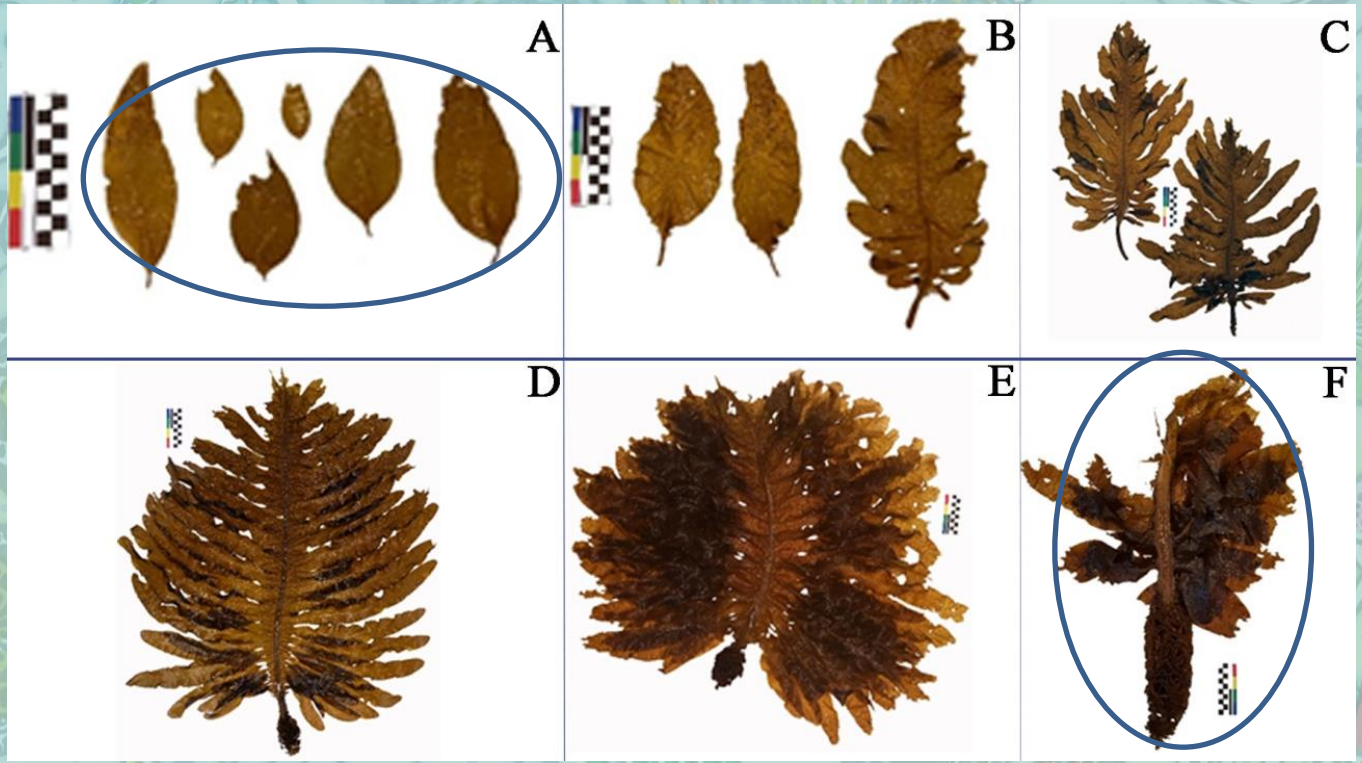
Objective

- Evaluate the seasonal evolution of:
  - Biomass density
  - Morphology and yield of different tissues
  - Fucoidan content
  - Total phenolic, As and Cd content

Experimental

- Year-round monthly sampling
- Subtidal rocky bottom, 5 m depth at low tide
- Five 1 m^2 quadrats each month
- 11 morphometric parameters registered on each *U. pinnatifida* sporophyte
- Wet weight of each tissue (blade, midrib and sporophyll)
- Classification of each thalli according morphological development

Experimental



Experimental

- Fucoidan
  - Sporophyll subsamples of each month
  - Acid extraction
  - Gravimetric quantification
  - Sulphate content (turbidimetric)
  - Neutral sugars (GC)

- Phenolic compounds
  - Ethanol extraction / Folin-Ciocalteu Method

- Cd and As
  - Microwave digestion / ICP-OES

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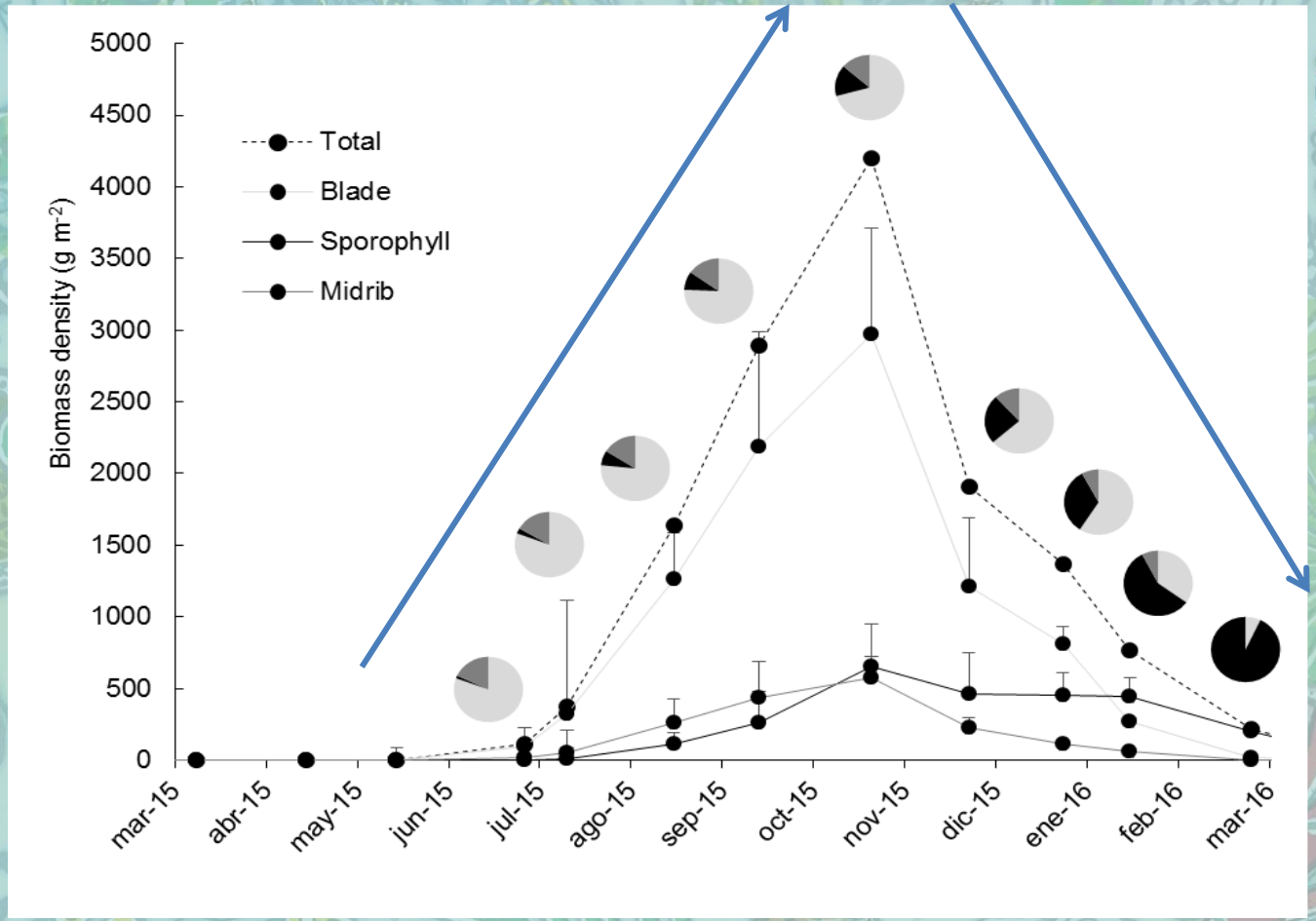
Results



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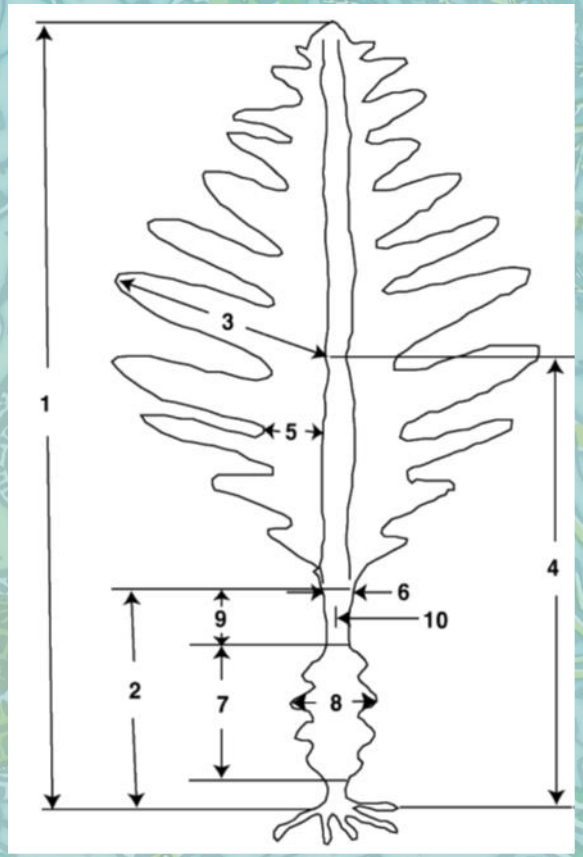
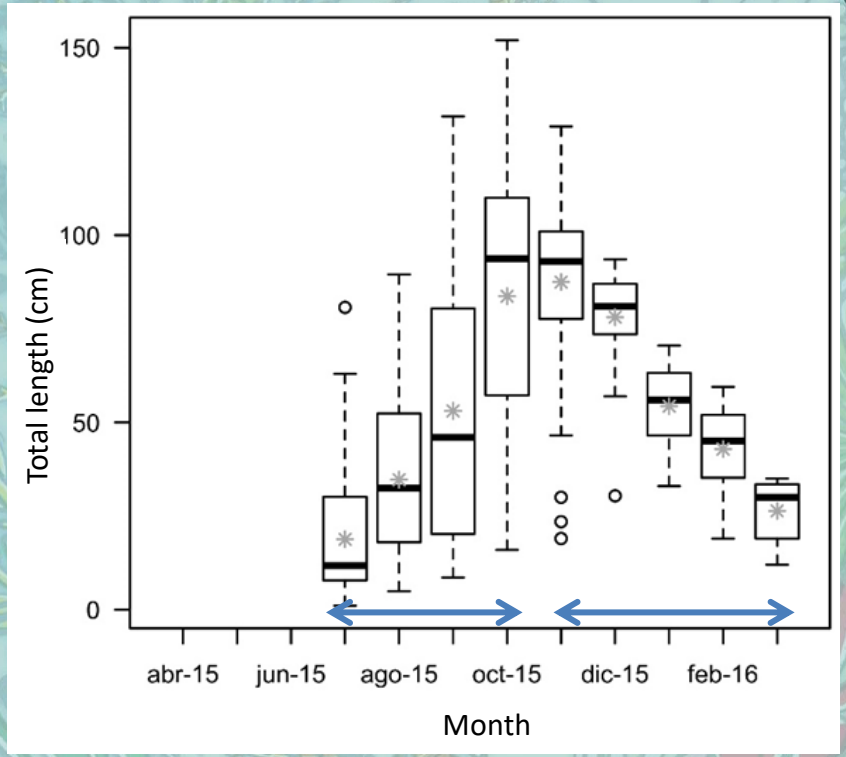
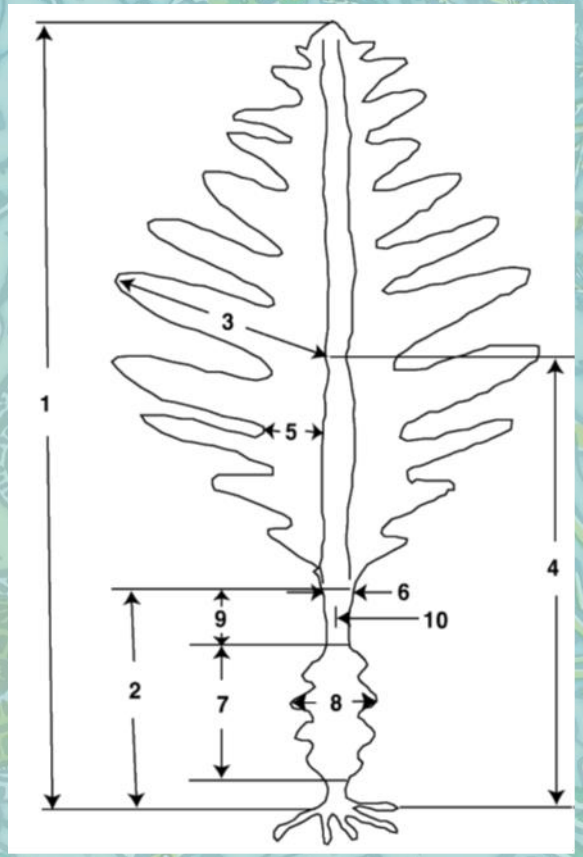
Results

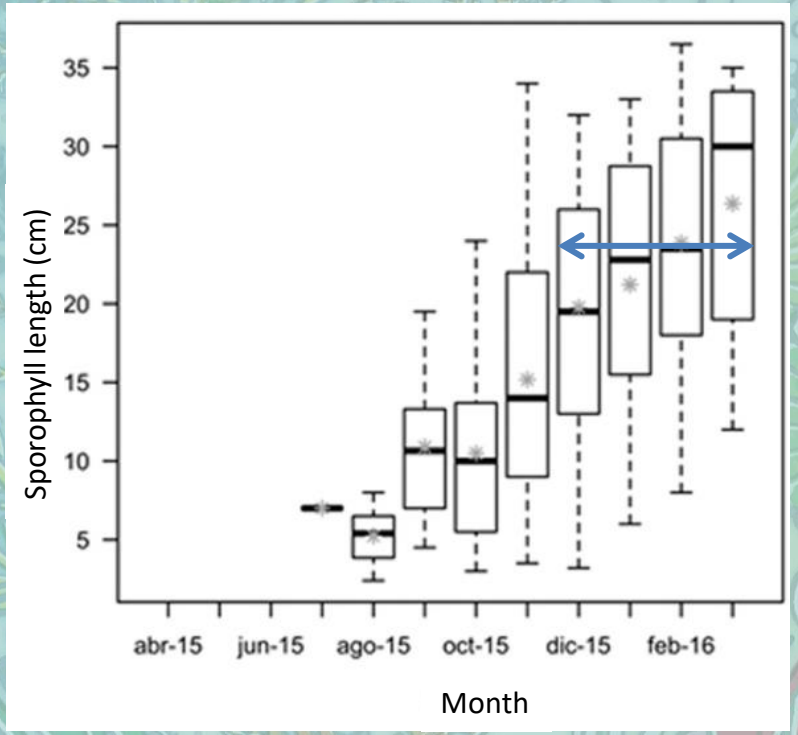




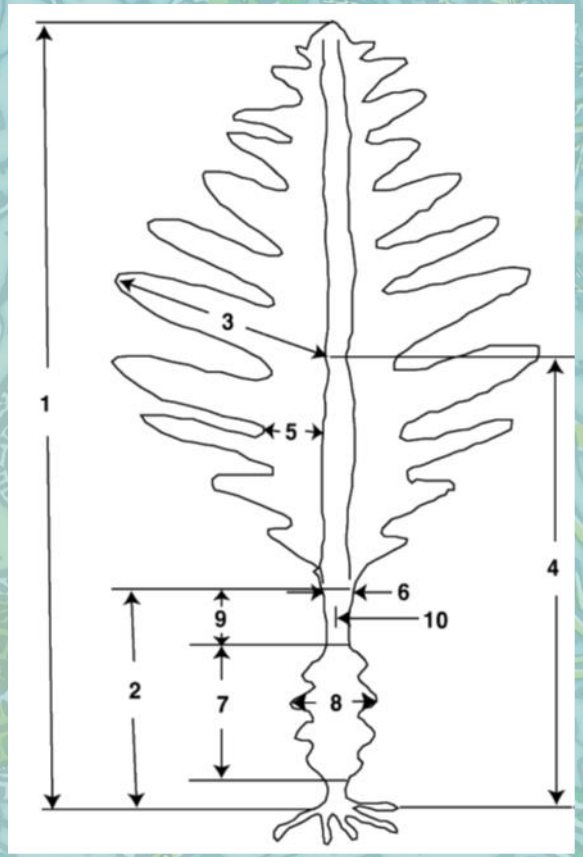
Choi et al 2009. Growth and morphology of *Undaria* in Korea

Results


1
2
3
4
5
6
7
8
9
10


Sporophyll length (cm)
35
30
25
20
15
10
5
abr-15
jun-15
ago-15
oct-15
dic-15
feb-16
Month

Results


1
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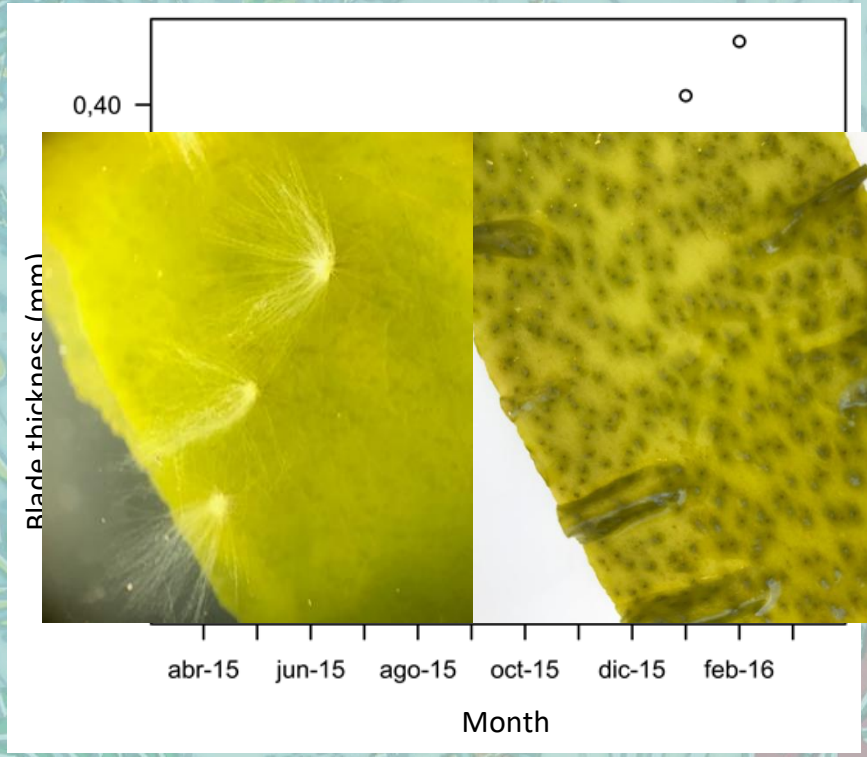
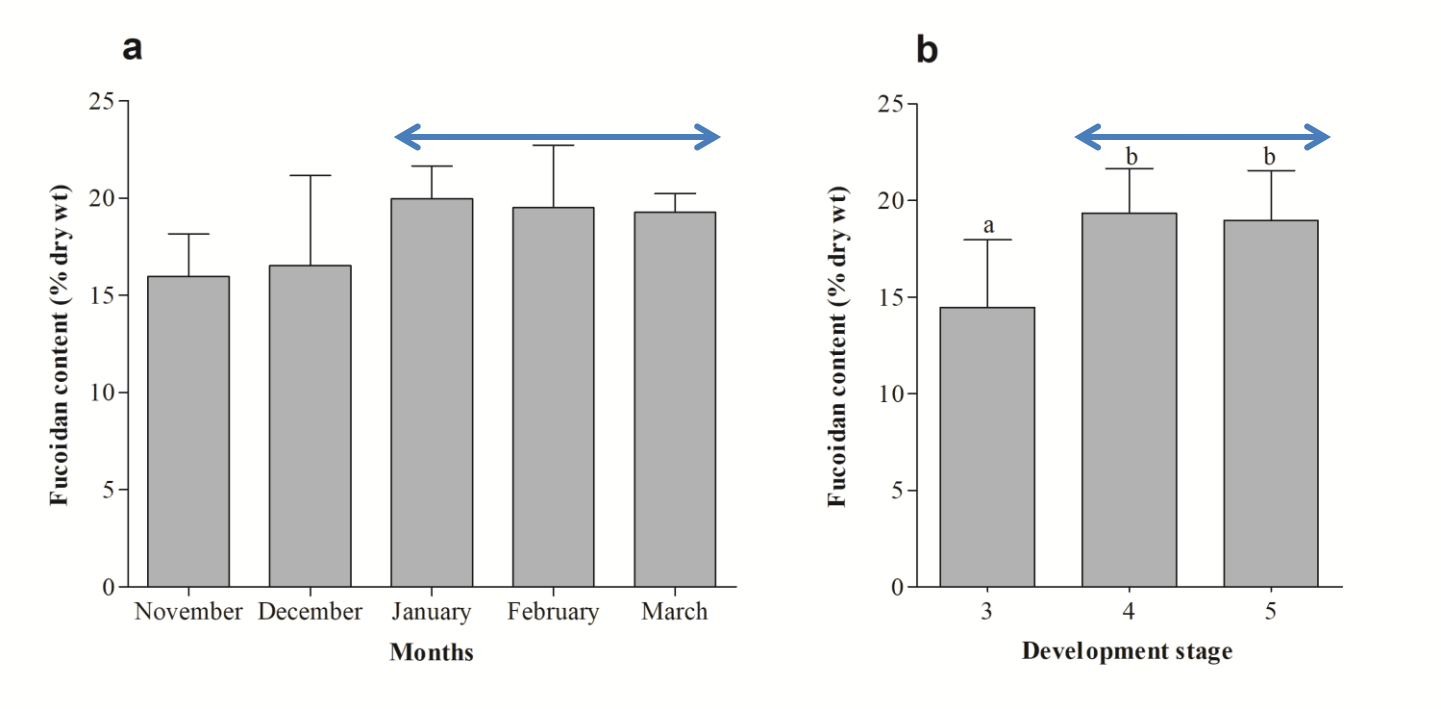
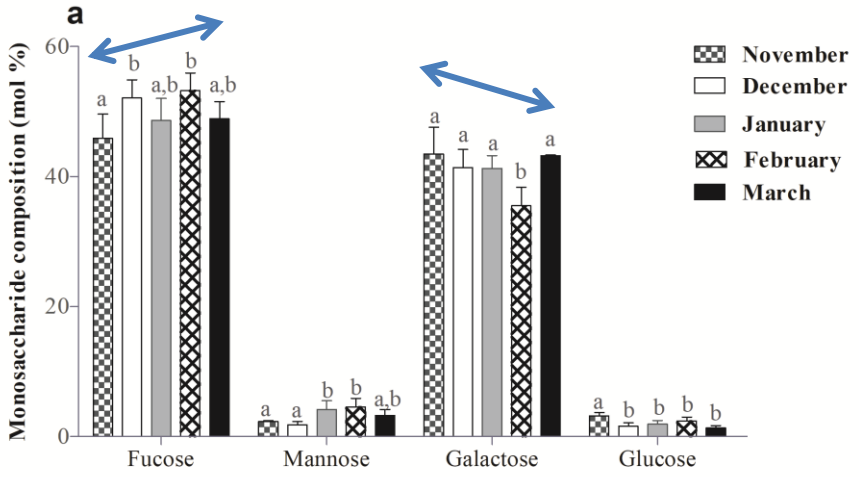

0,40
Blade thickness (mm)
abr-15
jun-15
ago-15
oct-15
dic-15
feb-16
Month

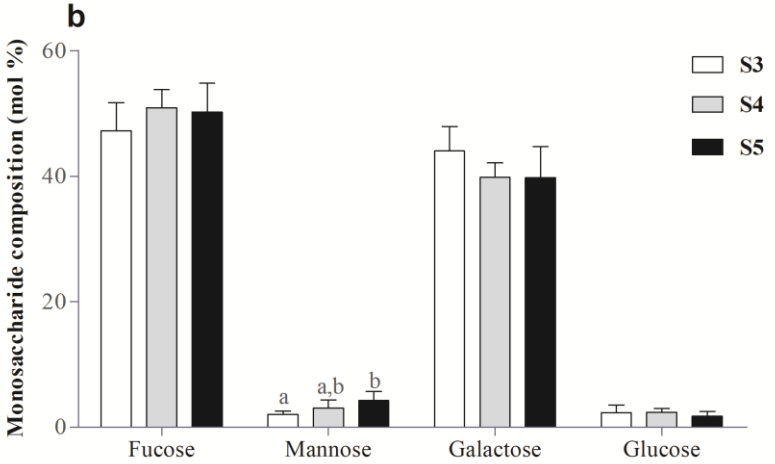
Results

Fucoidan content in sporophylls



Results





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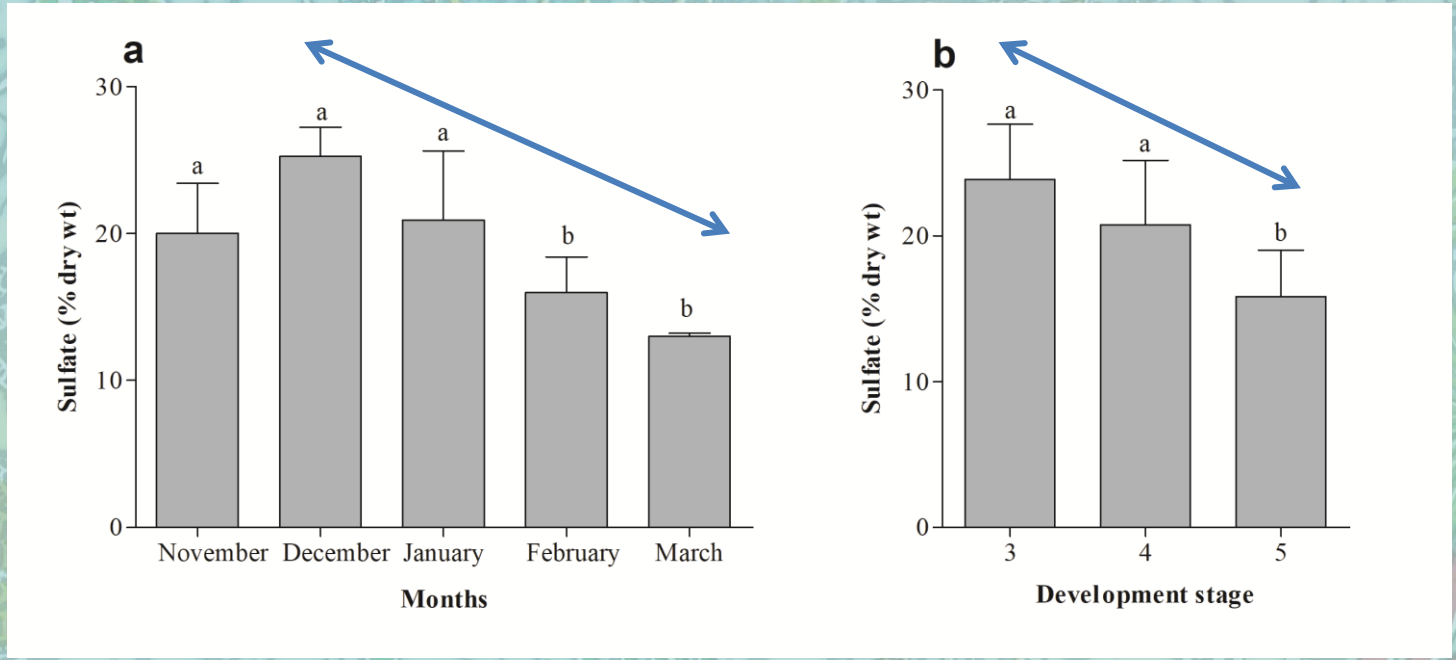
Results



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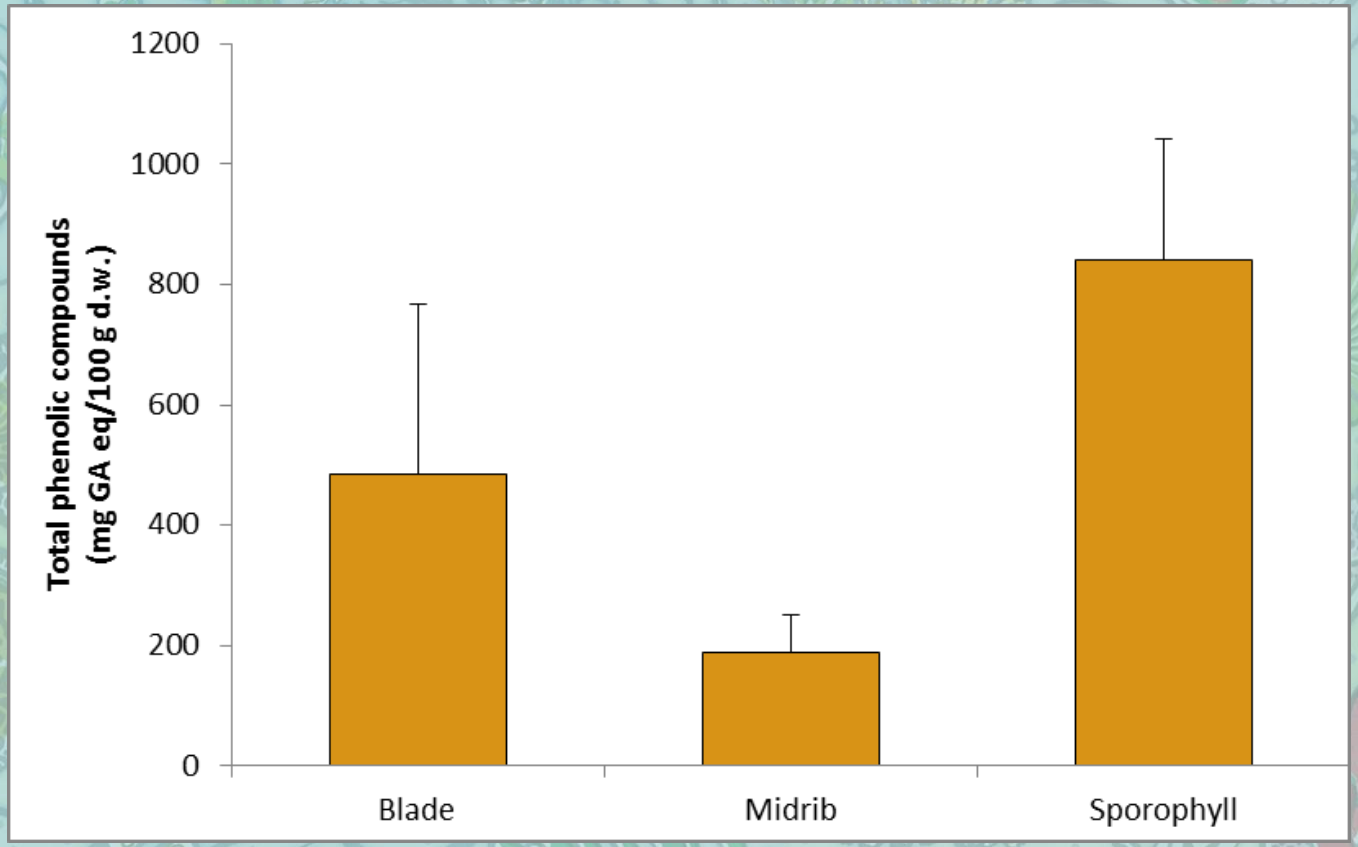
Results



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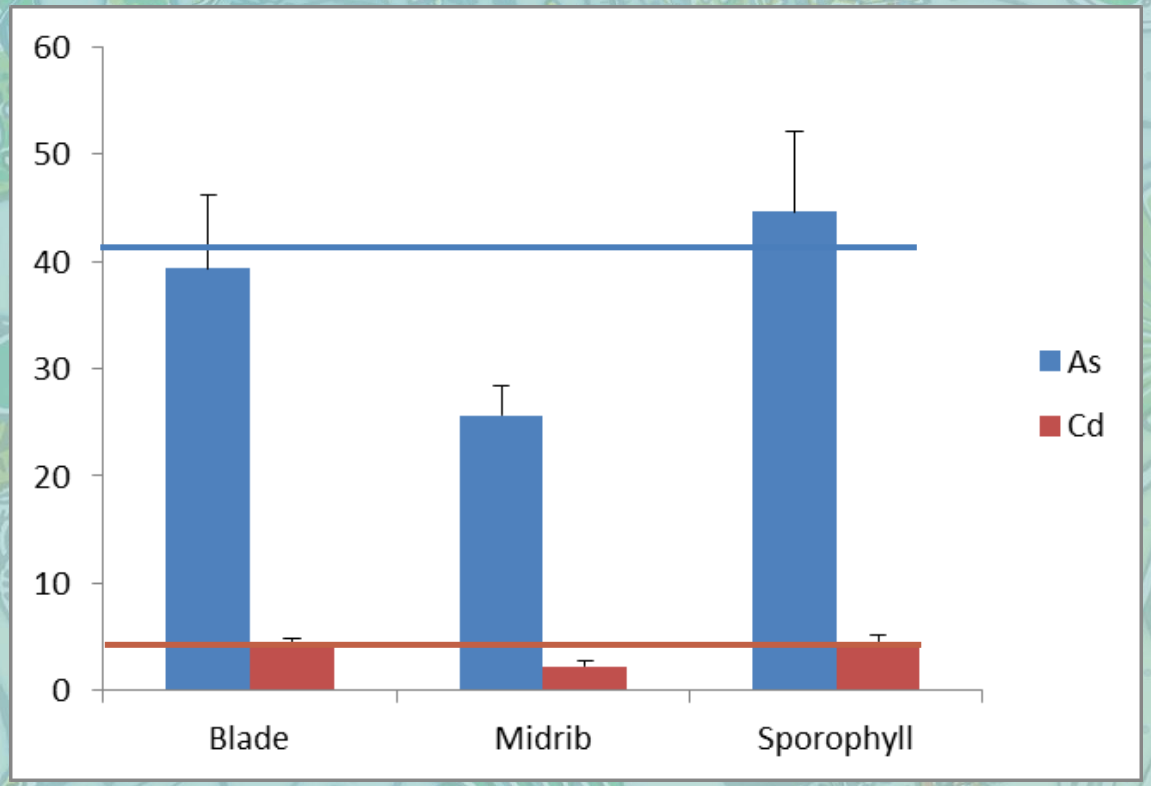
Results



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Conclusions

- *Undaria pinnatifida* is a markedly seasonal resource in the patagonian coasts
- Blade for wakame production between july and october
- Further studies are needed addressing other quality parameters for wakame production
- As and Cd presents a problem for its food use
- Sporophyll for fucoidan (and food) production between October and March (high biomass density / high fucoidan yield)
- Seasonal and geographic Variations in fucoidan content and composition should be further studied
- Further research on the phenolic content of sporophylls could be valuable to develop a biorefinery approach for the extraction of valuable fucoidans, lipids and phenolic compounds from this abundant biomass

Thanks for your attention!!

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