

# Growth and structural changes of viviparous mangrove propagules: The effect of environment on dispersal and establishment

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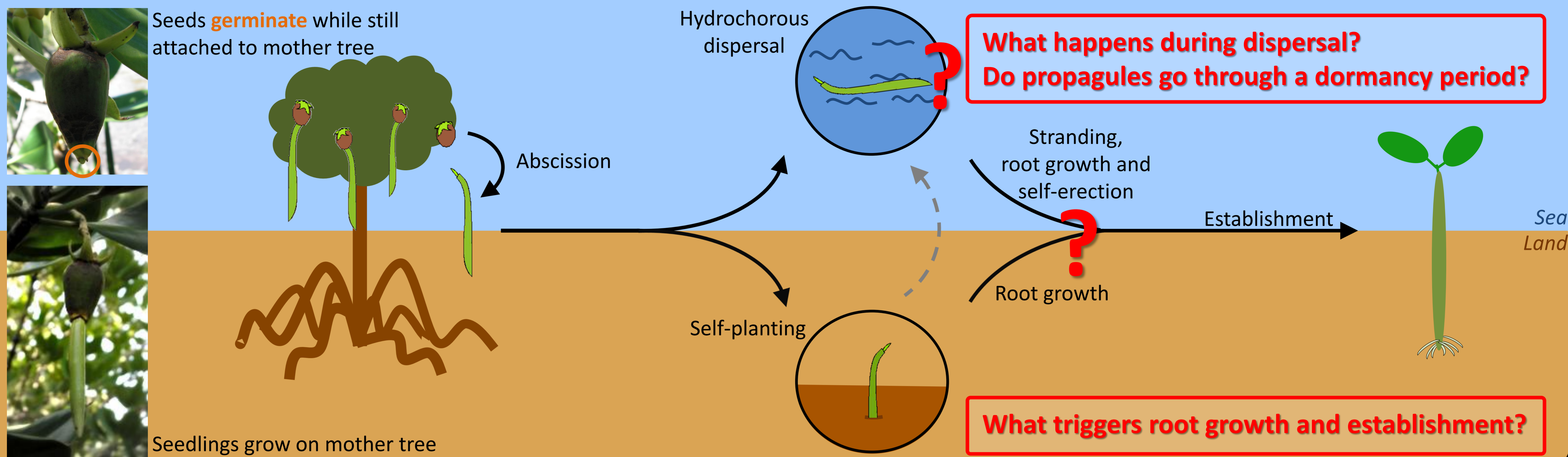
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## Introduction

### Life cycle of viviparous mangrove trees

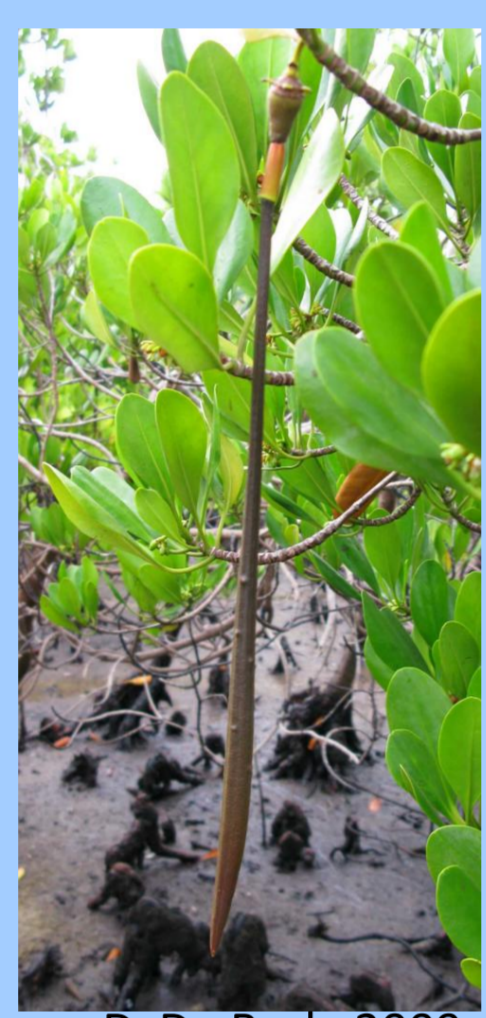
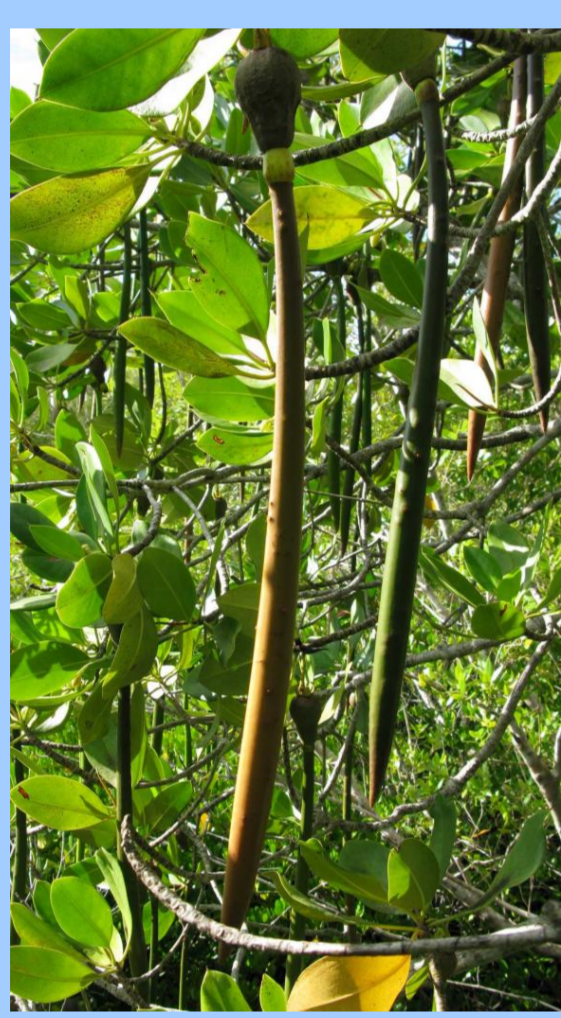


## Material and methods

Studied species:

*Rhizophora mucronata*

*Ceriops tagal*



D. De Ryck, 2009

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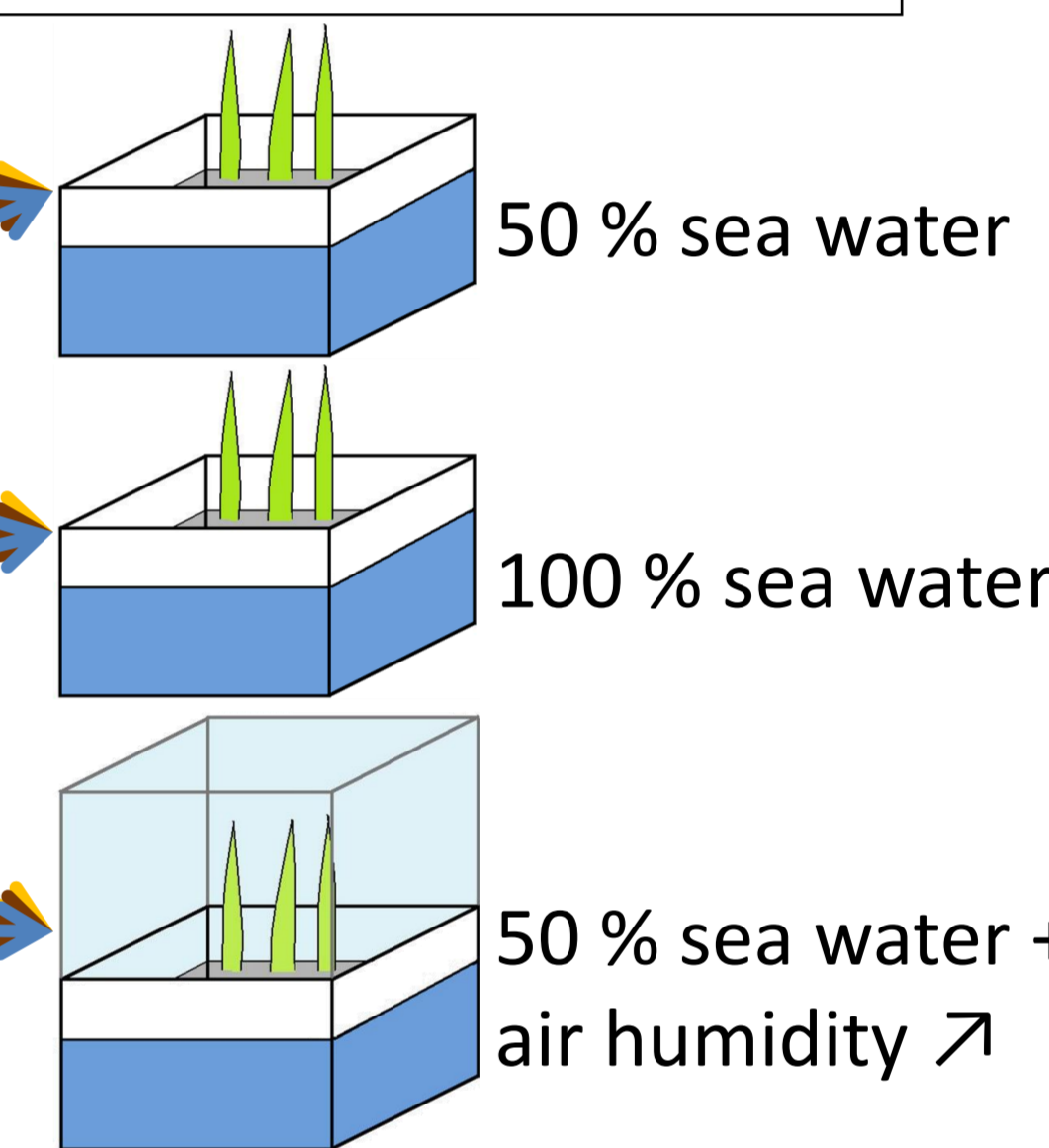
Mature propagules were collected on a landward and a seaward site in Gazi Bay, Kenya, East-Africa

### Simulation of the period between abscission and establishment on different substrates



Propagules are left on one of the three substrates for different periods of time.

### Simulation of establishment in different hydroponic set-ups

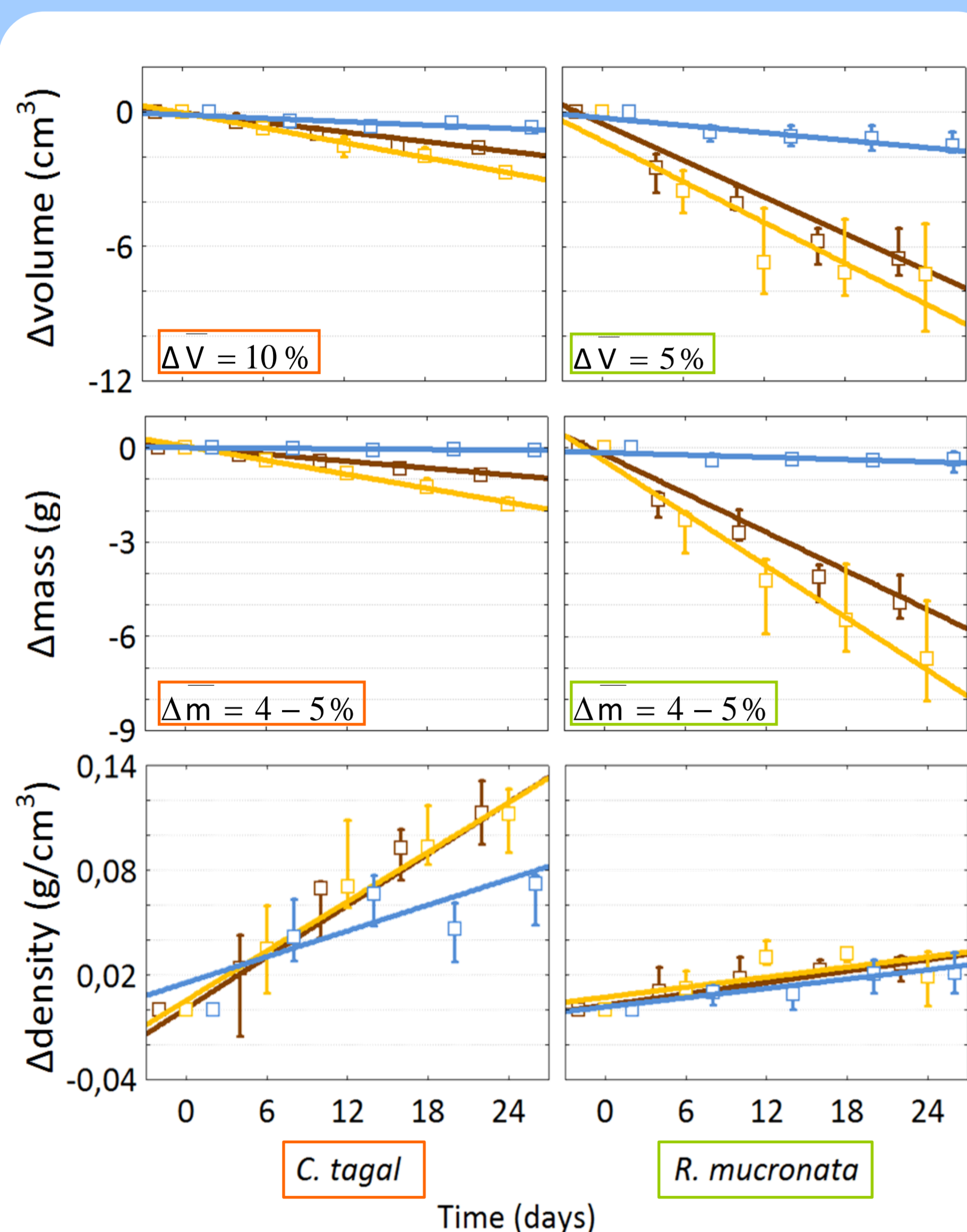


...and placed in one of three different hydroponic set-ups for 24 days

Every 6 days, three propagules are taken from each substrate...

## Results and conclusions

### Between abscission and establishment:

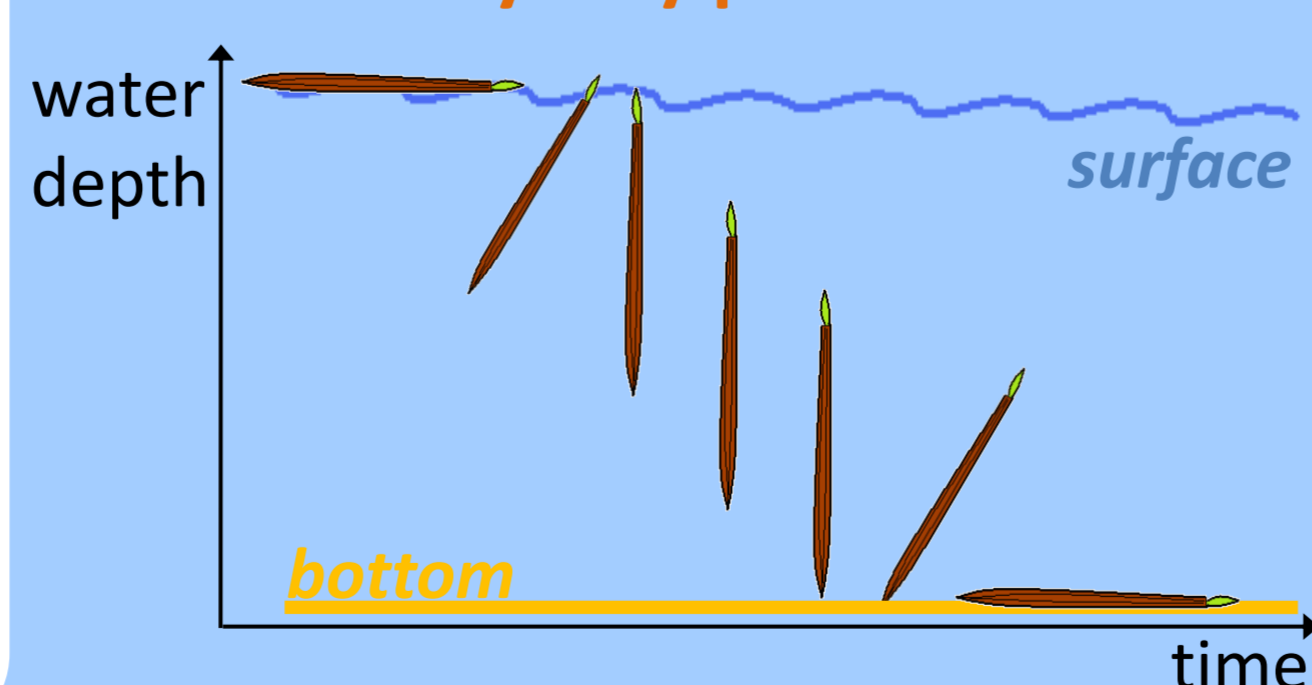


-Propagules do not grow in length nor in diameter  
-No root growth before the 13th day after abscission  
⇒ **delayed dormancy period**

For both species: propagule volume and mass declined:  
- most for propagules on **dry sand**  
- least for propagules in **sea water**

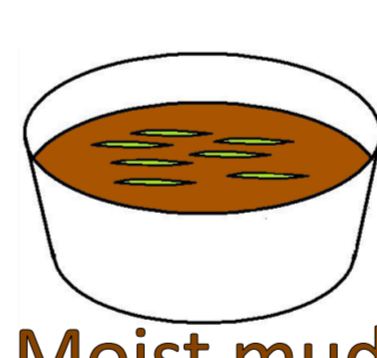
For *C. tagal* propagules, the volume decreased more and faster than the mass

⇒ **density increased faster**  
⇒ **clear buoyancy pattern**



### During establishment:

*C. tagal*:



Moist mud

- **longest roots**
- **leaves start to grow**
- ⇒ needs humidity to establish
- ⇒ energy first invested in root and leaf growth

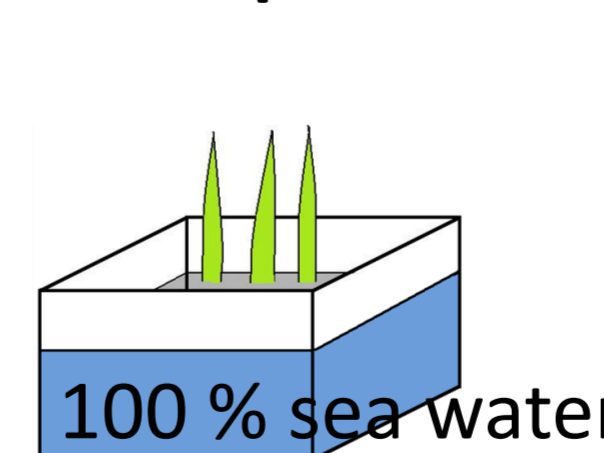
*R. mucronata*:



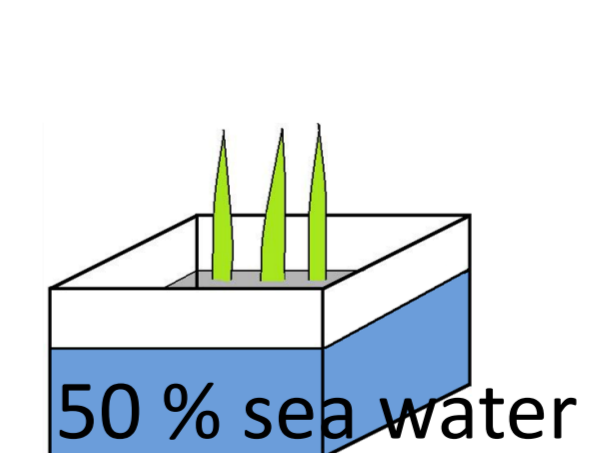
Dry sand

- **start first to grow roots**
- **no leaf growth**
- ⇒ needs dehydration to establish
- ⇒ energy first invested in root and length growth

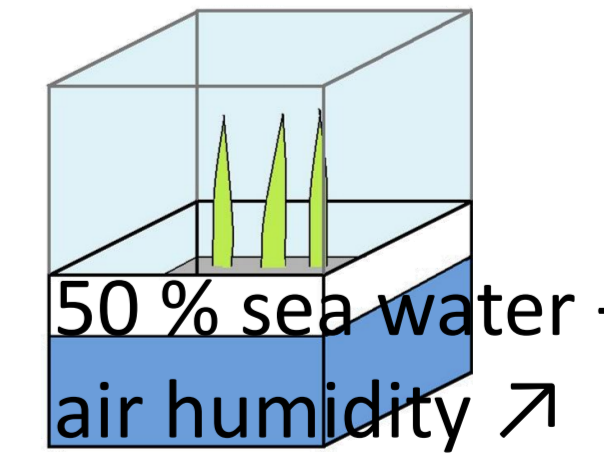
For both species:



100 % sea water



50 % sea water



50 % sea water + air humidity ↗

Root length and length growth after 24 days

In agreement with distribution pattern in Gazi Bay:

*R. mucronata*: close to the sea  
→ high inundation frequency = hindrance for establishment → roots  
→ closed canopy = limited light → length

*C. tagal*: close to the land  
→ low inundation frequency = water shortage → roots  
→ open forest = no light limitations → leaves