THE ROLE OF **WIND** IN **HYDROCHOROUS** MANGROVE PROPAGULE DISPERsal

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\textsuperscript{\circledast} Equal contribution

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2. HYPOTHESIS

Life cycle of a viviparous mangrove tree

<table>
<thead>
<tr>
<th>Growth on the parent tree</th>
<th>Planting/Dispersal</th>
<th>Establishment and growth</th>
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Growth on the parent tree

- Hydrochorous dispersal
- Abscission
- Root growth & self-erection

Planting/Dispersal

- Self-planting
- Tidal wave action

Establishment and growth

- Root growth
- PLANTING

J. Oste (2010)
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1. Wind is an **important vector** in the dispersal of *hydrochorous* mangrove propagules
2. The effect of wind is **species-specific**
3. The effect of wind largely depends on the propagule’s **density** and **floating orientation**
3. FIELD STUDY – M&M
3. FIELD STUDY - RESULTS

**Diagram Description:**

- **Ceriops tagal** and **Rhizophora mucronata** frequency distribution over dispersal distance in both horizontal and vertical directions.
- The dispersal distance ranges from 0-50 to 2751-2800 meters.
- The horizontal and vertical distributions show different patterns, indicating varying dispersal mechanisms for each species.

**Map:**

- The map in the upper right corner suggests a geographical context for the field study results, noting wind direction.
3. FLUME STUDY

- wind flow direction (cte)
- water flow direction (cte)

- Rhizophora mucronata
- Ceriops tagal
- Heritiera littoralis
- Xylocarpus granatum (fruit)
- Xylocarpus granatum (seed)
3. RESULTS - FLUME

![Graph showing results for different species in a flume experiment. The graph plots mean dispersal velocity against species. The legend indicates symbols for different wind conditions: NO wind, wind SAME DIRECTION as water flow, and wind OPPOSITE to water flow. The graph includes error bars for each data point.](image)
3. RESULTS - FLUME

![Graph showing results for different water current speeds.]

- For water current speed 0.15 m s\(^{-1}\):
  - Equation: \( y = -0.0737x + 105.67 \)
  - Data points labeled: HI, Xg seed, Xg fruit, RmH, CtH

- For water current speed 0.30 m s\(^{-1}\):
  - Equation: \( y = -0.043x + 53.469 \)
  - Data points labeled: HI, Xg seed, RmH, CtH, CtV
CONCLUSIONS

Dominant wind forces strongly determine the dispersal path of hydrochorous (mangrove) propagules.

*The influence of wind is more pronounced...*

...for dispersal units with a lower density.

...for horizontally floating propagules compared to vertical floating counterparts.

MANY THANKS FOR YOUR ATTENTION!

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