

# Comparison of pneumatophore characteristics and epiphytic microalgae between two distinct mangrove wetlands in Hong Kong

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## Introduction

- Avicennia marina* is one of the mangrove species which grows vertical root that exposed to atmosphere called pneumatophores to facilitate gaseous exchange during low tide (Mai et al., 2022; Purnobasuki, 2011)
- Epiphytic algae were found on pneumatophore and revealed that it may contribute to pneumatophore by producing oxygen through photosynthesis during high tide (Pongener et al., 2018)
- Objective: to compare the difference in pneumatophore characteristic, epiphytic microalgae and environmental variables in two mangrove sites with different features in Hong Kong

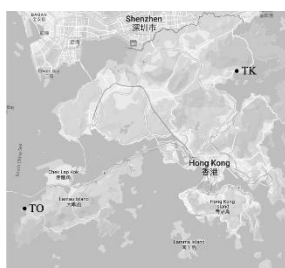
## Materials and methods

### Sampling sites:

- Ting Kok (TK)
- Tai O (TO)

### On-site measurements:

- Water quality parameters
- Pneumatophore density and height



Geographic location of sites



Sediment and pneumatophore sampling

### Laboratory analyses:

- Pneumatophore: lenticels and epiphytic microalgal counting, and 18S amplicon sequencing for microalgae
- Seawater: nutrient and heavy metal concentration, and 18S amplicon sequencing for microalgae
- Sediment: nutrient and heavy metal concentration, and moisture content

## Microalgal compositions

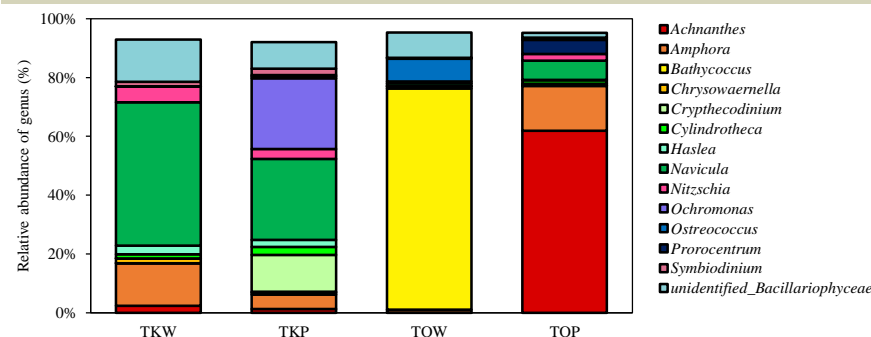


Figure 1. Relative abundance (%) of microalgae at genus level in seawater and on pneumatophore in two sites, W: seawater, P: pneumatophore

- Compositions of microalgal community varied in seawater and on pneumatophore in two sites, thus difference in microalgal community among sites was observed
- High relative abundance of *Navicula* (48.68%), *Bathycooccus* (75.17%) and *Achnanthes* (61.92%) were found in seawater in Ting Kok, Tai O and on pneumatophore in Tai O, respectively

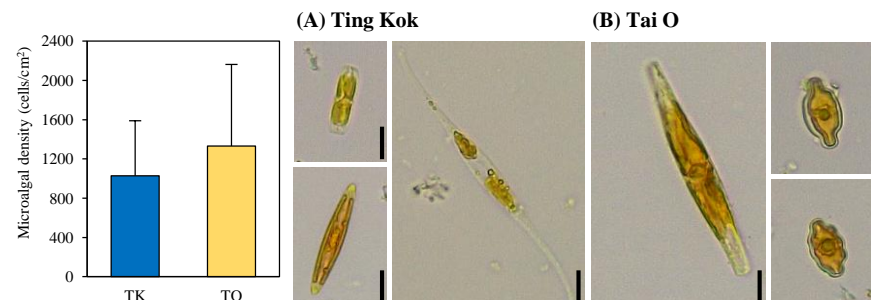


Figure 2. Microalgal density on pneumatophores of Ting Kok and Tai O

- Epiphytic microalgal density on pneumatophores in Tai O is higher than that of Ting Kok
- Dominant epiphytic microalgae species on pneumatophores of two sites are different

## Pneumatophore characteristics

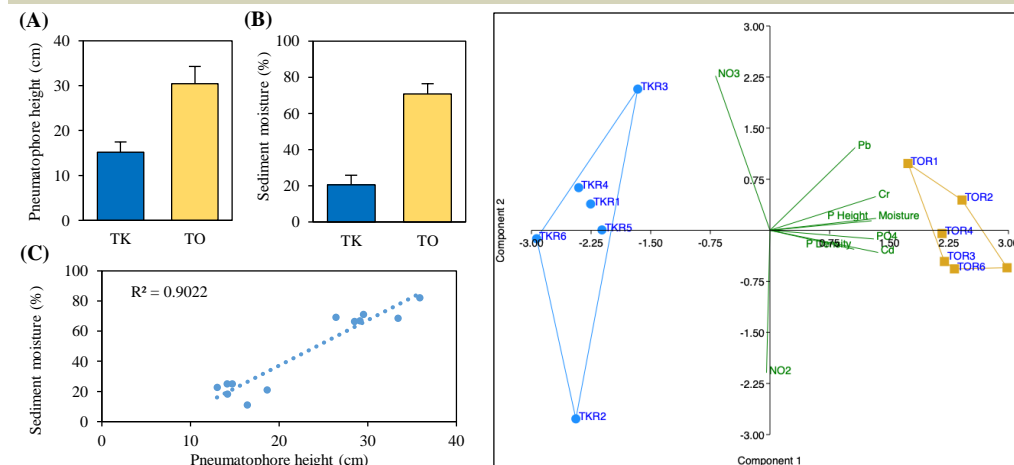


Figure 3. Mean±SD of (A) pneumatophore height, (B) sediment moisture in Ting Kok and Tai O and (C) correlation of two measurements

- The pneumatophore height and sediment moisture of Tai O is much higher than that in Ting Kok
- Pneumatophore height and sediment moisture content are strongly positive correlated ( $R^2=0.902$ ) and statistically significant ( $p<0.05$ )
- PCA result demonstrated that the features of mangrove in Ting Kok and Tai O are very different, and correlated very differently with the physiochemical parameters as well as the pneumatophore characteristics

## References

- Mai Z et al. (2021). Characteristics of microbial community and function with the succession of mangroves. *Frontiers in microbiology*, 12.
- Pongener, L., Padmavati, G., & Jayabarathi, R. (2018). Meiofauna and microalgae associates on the pneumatophores of *Avicennia marina* from the coastal waters of South Andaman, India. *International Journal of zoological Studies*, 3, 203-212.
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## Acknowledge

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