Site Adaptability of Mangrove Species in Myanmar

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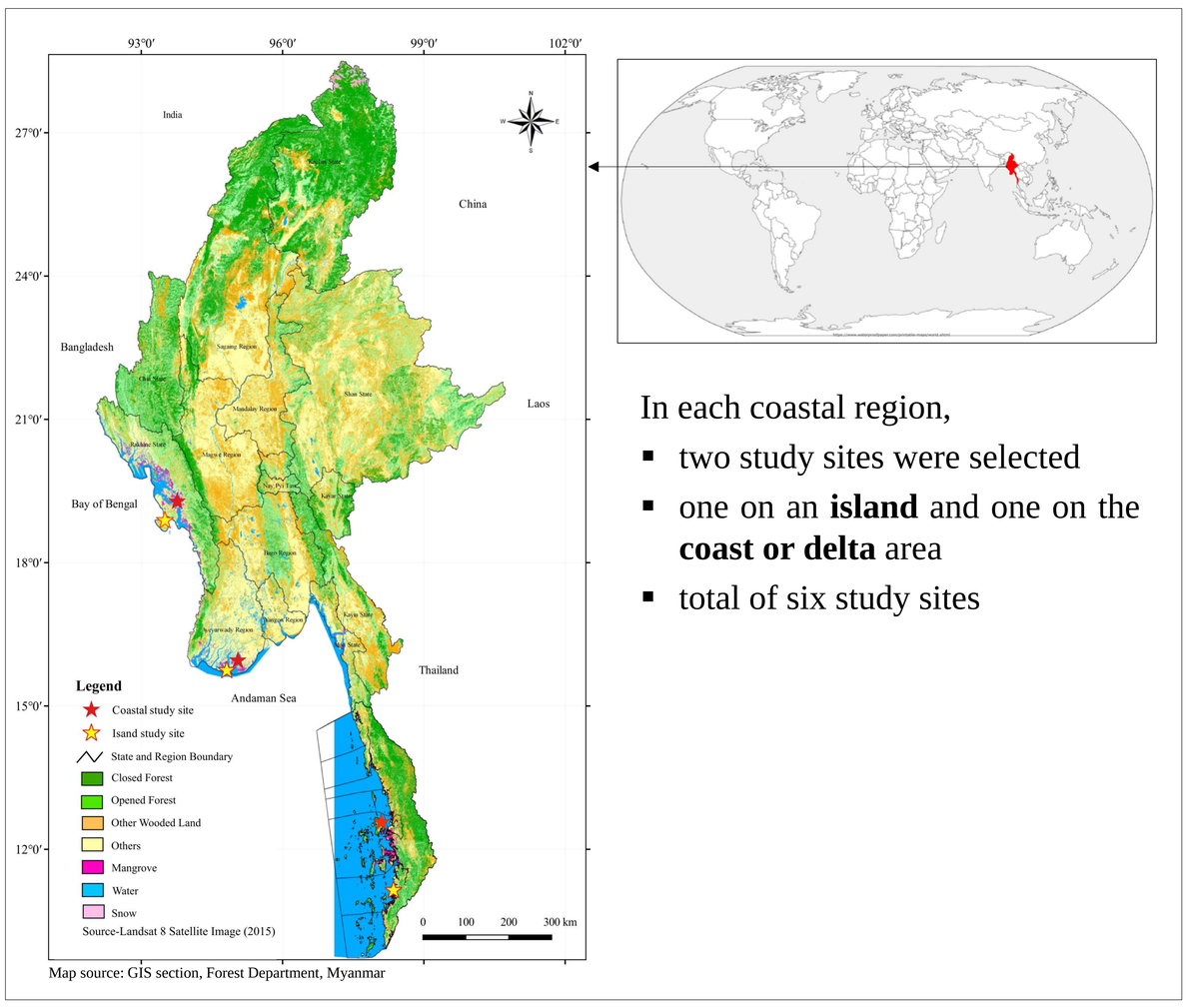
Introduction

Myanmar possesses about 2800 km of coastline along which mangroves occur in three different coastal regions. Due to anthropogenic influences and natural disasters, mangrove forests in Myanmar are being degraded at an alarming rate. Mangrove rehabilitation programs are being carried out in all the coastal regions. Site-species matching is crucial for successful mangrove reforestation. Salinity is a limiting factor for the growth of mangroves and osmoregulation is one of the strategies mangrove species use to cope with saline site conditions .

Objectives

- to observe the interaction between the mangrove species and their growing sites
- to determine the most saline-tolerant species from respective intertidal zones

Study Areas and Study Sites



In each coastal region,

- two study sites were selected
- one on an **island** and one on the **coast or delta** area
- total of six study sites

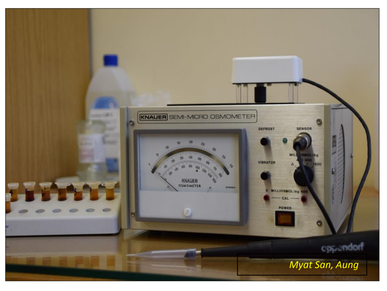
Figure 1. Land use and land cover map of Myanmar and the locations of study sites

Method

- Leaf samples of dominant species and soil samples of their growing sites were collected from each study site in the dry season.
- For each species, 8-10 grams of fresh leaves were collected from southward exposed branches of 5-6 sampled trees in the afternoon for midday osmotic potential measurement.
- The leaf collection was also done from the small branchlets cut from the same branch after full saturation by12-hour bathing in the half-filled water bucket on the next early morning for the saturated osmotic potential measurement.
- The leaves were killed off by careful heating soon after collection.
- 8-10 g of soils were collected from two depths 10-20 cm and 50-60 cm from a soil pit ≤ 2 m from the sample tree.
- The osmotic potential of leaf and soil samples were measured according to standard cryoscopic procedures described by Kreeb (1990).

Leaf samples collection

Soil samples collection



Cryoscopic analysis

Results

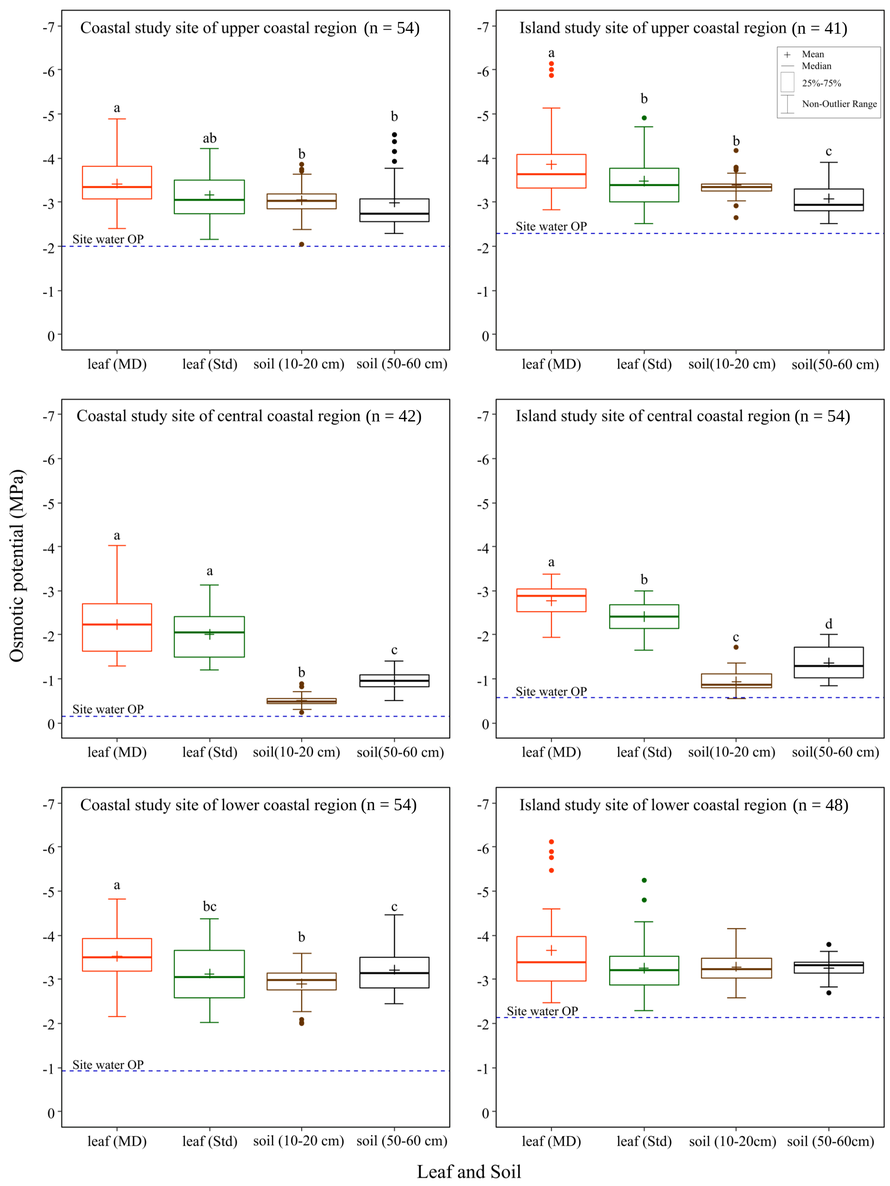


Figure 2. Comparing midday leaf osmotic potentials (MD), saturated leaf osmotic potentials (Std), osmotic potential of soils at 10-20 cm and 50-60 cm layers from the different study sites of three coastal regions in Myanmar; OP = osmotic potential; Kruskal-Wallis test ($p < 0.05$); n = total number of individuals for each variable.

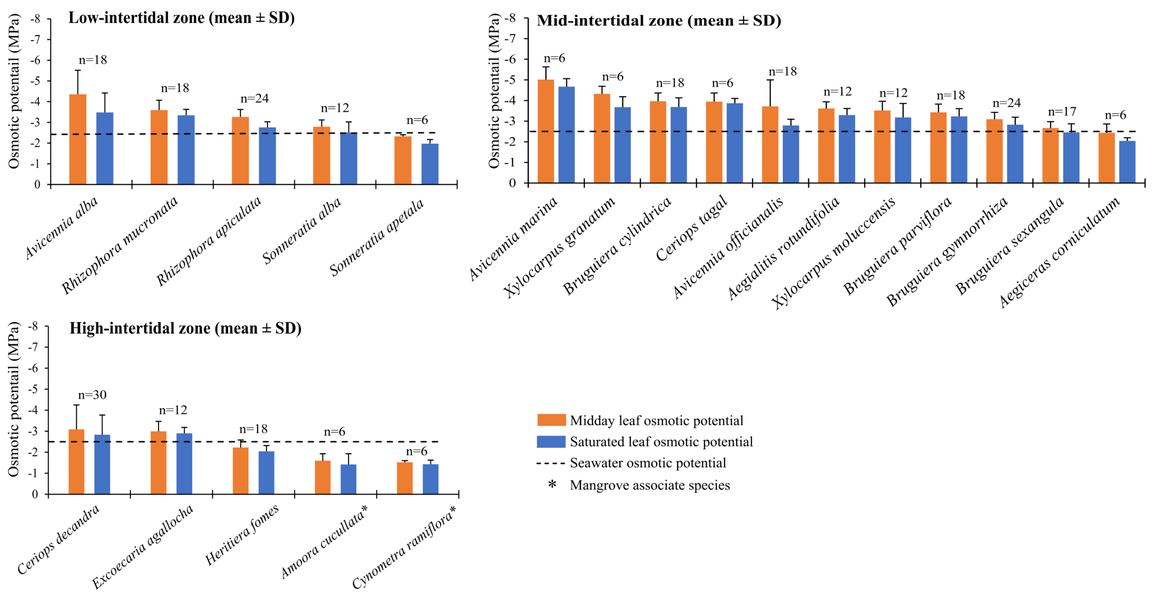


Figure 3. The comparison of leaf osmotic potentials of 21 tree species from different coastal regions in Myanmar according to the intertidal zones. Species are arranged in ascending order by lowest midday osmotic potential in each intertidal zone.

Conclusion

Saturated leaf osmotic potential of mangroves is relevant to use as an indicator of site conditions due to its close proximity to soil osmotic potential, and vice versa.

The mangroves with lower osmotic potential are more tolerant to high saline site condition, and they should be selected to plant at the respective intertidal zones of the reforestation areas.

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