TUESDAY, JULY 19, 2016

Session 4: Macrobenthos and Marine Communities, Part II

Moderator: Norman C. Duke

3:00 PM Yara Schaeffer-Novelli

Relationship between the biomass of mangrove roots and the density of the polychaete species *Capitella* sp.

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Interdisciplinary Project Benthic and Mangrove System Modules:
"Biodiversity and functioning of a subtropical coastal ecosystem: support for integrated management Araçá Bay, São Paulo State, Brazil"

BIOTA/FAPESP-ARAÇÁ

Araçá Bay, São Paulo State, Brazil
Latitude 23º30'S

Google modified

Araçá Bay

Total area: ±500,000 m²

Perimeter: 3.3 km

Approx. 49 soccer fields

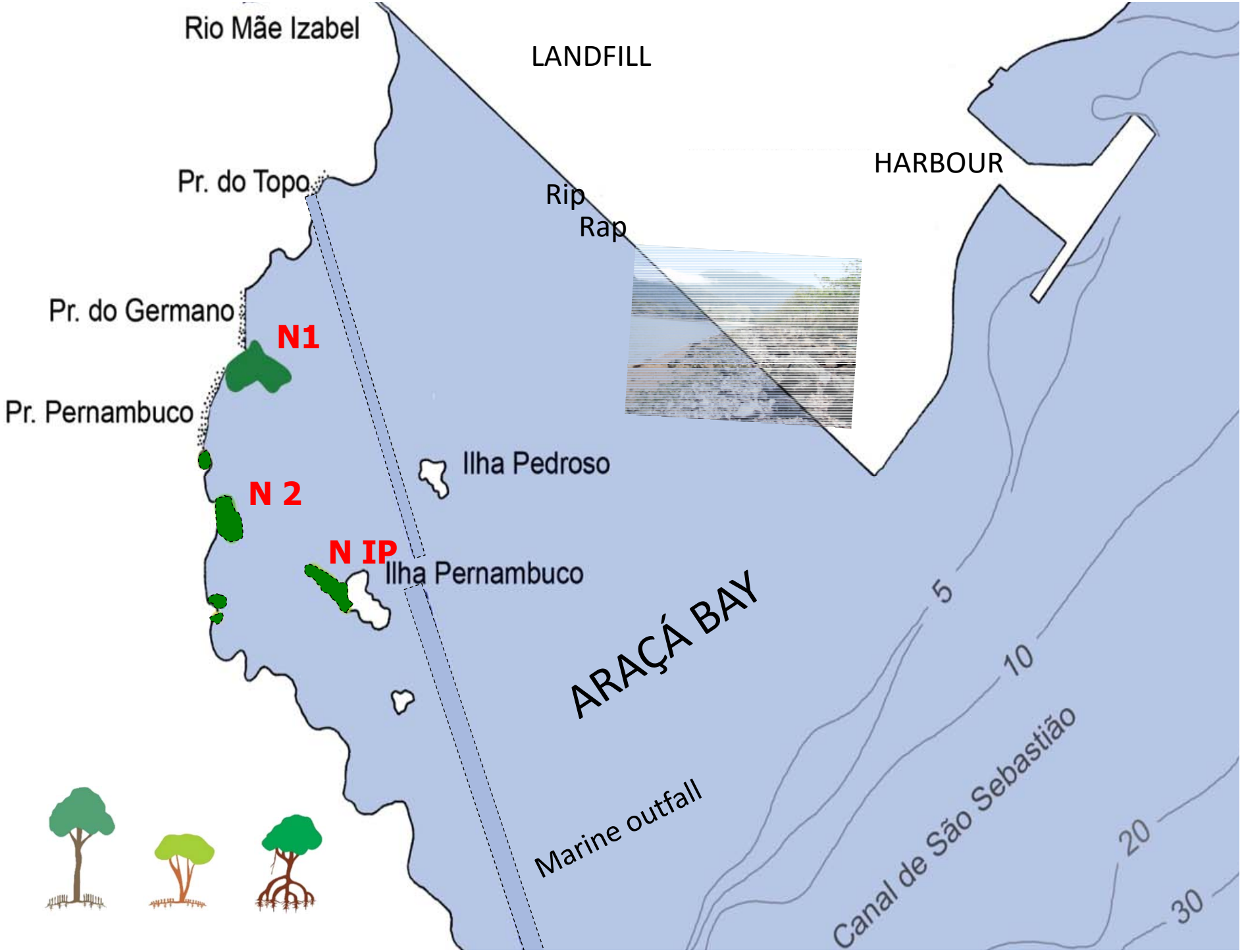
Annual mean air temperature = 20ºC

Annual mean precipitation = 2,600mm

Semi-diurnal tides, mean level = 0.66m

Total mangrove area = 3,644m²

The area has been modified in the last decades by several landfills and dredges made to the installment of the São Sebastião Port and by a marine outfall.


Rio Mãe Izabel
LANDFILL
HARBOUR
Pr. do Topo
Rip
Rap
Pr. do Germano
N1
Pr. Pernambuco
Ilha Pedroso
N 2
N IP
Ilha Pernambuco
ARAÇÁ BAY
5
10
20
30
Marine outfall
Canal de São Sebastião

The Araçá Bay Systems

- Comprises a vast intertidal flat up to 300 meters wide, and a shallow subtidal zone; both of muddy and silty bottoms, with some gravel contribution.

- The intertidal zone is a sedimentary heteregoneous sandflat, with patches of very fine to coarse sands, a reflex of past disturbances at the area.

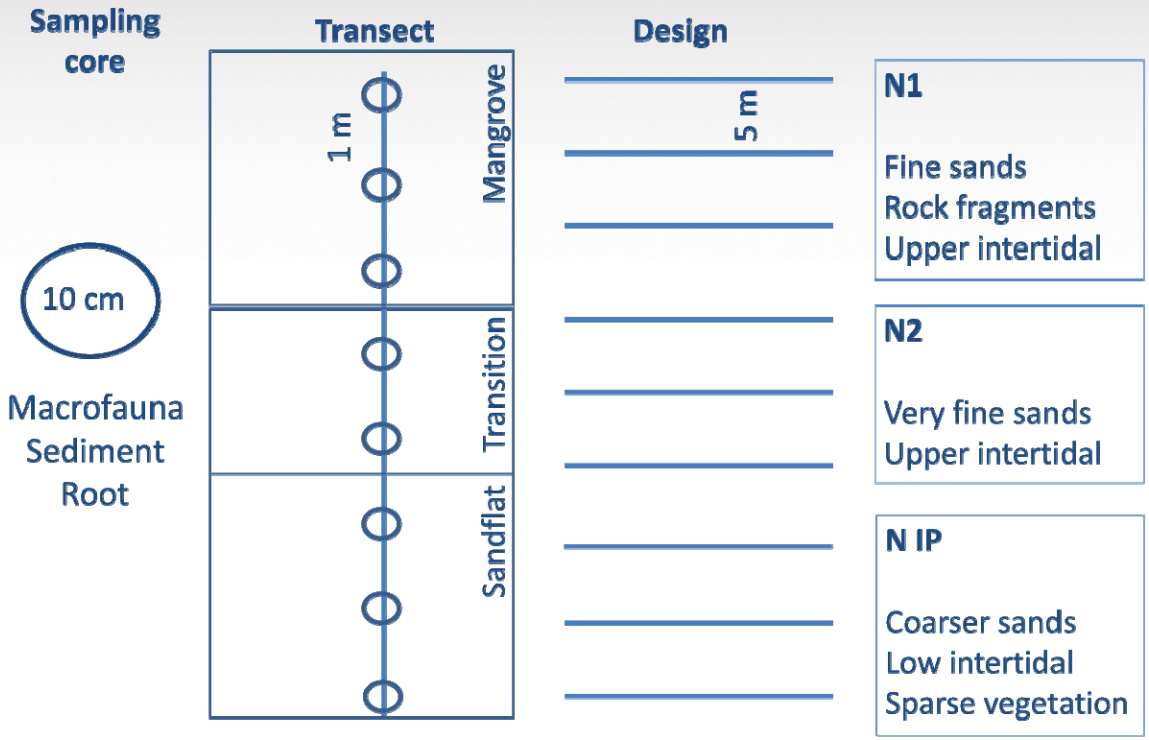
Objectives

To evaluate the relationship between mangrove roots (dry weight) and the polychaete species *Capitella* sp. at three mangrove stands

Hypothesis

Mangrove roots affect *Capitella* sp abundance

Sampling design and equipment



- Substrate is composed of a mixture of sand and mud, with some gravel contribution.
- Transects placement was done to create three zones, forming a gradient from the exposed sandflat to the mangrove interior, under the pneumatophore surface cover (mainly an Black Mangrove dominated zone).
- PVC cylindrical corer (d = 10 cm) was used to sample polychaete fauna, at 20 cm deep.
- Three samples were considered as "Outside" (Sandflat); two as "Transition", and the last three as "Inside" (Mangrove) at each of the three mangrove stands.

Mangrove stands are located more than 100m apart from each other.

Sampling at N 1, outside zone.

General procedure

- Sediment was washed on sieves (mesh size = 0.5 mm) and the retained fauna was fixed on 70% alcohol.

- Macrofauna taxonomic identification was made to the lowest possible level.

- A total of **5,785** individuals of *Capitella* sp. were sampled, **3,143** during summer and **2,642** during winter.

- During sample sorting mangrove roots were separate to evaluate plant belowground biomass.

- Root samples were dried and weight (g/unit area).

Capitella sp. abundance x mangrove roots (dry weight)

Table 1: Relationship between *Capitella sp.* abundance (log x + 1) and root weight at each mangrove stand, and with all stands included (* significative relation).

Stand	R^2	Est.
N1	0,632**	-0.679
N2	0,326**	-0.394
IP	0,103°	-0.336
Total	0,326**	-0.522

Table 2: *Capitella* sp. abundance in regards to transect area (mangrove, transition, sandflat) and mangrove stand (N1, N2, N IP). Results from nested mixed models with Poisson distribution.

	d.f.	SS	MS	F	p
Transect Area	2	19.813	9.9065	34.579	**<0,001**
Stand	2	13.951	6.9755	24.348	**<0,001**
Transect Area * Stand	4	3.035	0.75875	2.648	0.0365
Transect (Stand)	6	0.526	0.087667	0.306	0.932
Residuals	129	36.975	0.286628		

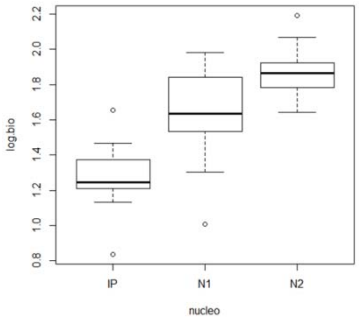


Fig. 1. Root biomass (Log) (Mean ± SD) at each of the three mangrove stands at Araçá Bay.

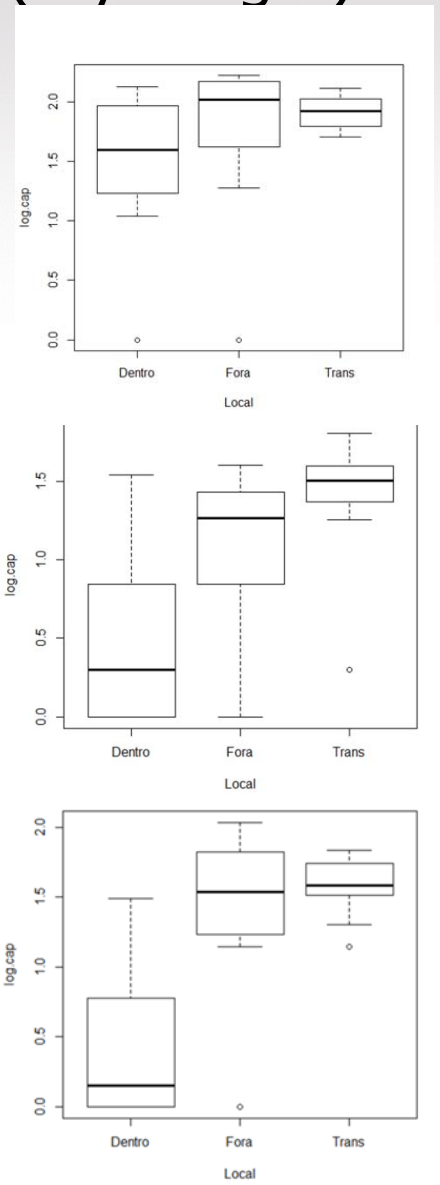


Fig 2. *Capitella* sp. abundance (log x +1) in regards to transect zone at each of the three mangrove stands at Araçá Bay.

RESULTS AND DISCUSSION

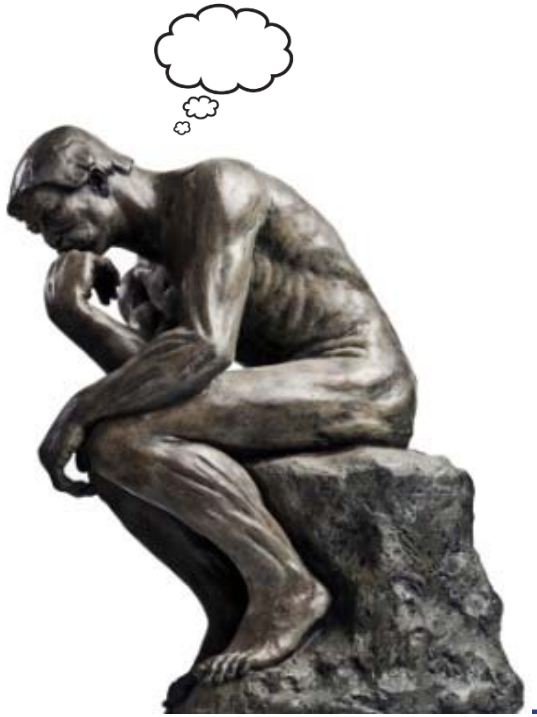
- *Capitella* sp. was the species of major contribution for all mangrove stands, occurring with much higher abundance at the outside zone.
- Abundance of *Capitella* sp. varied greatly among mangrove stands.
- The density of *Capitella* sp. had a negative relationship with the root biomass, with densities higher at the sandflat and transition zones.
- A decrease in *Capitella* sp. abundance was observed inside the mangrove stands.
- The abundance difference inside/outside N2 was even higher than at N1 and N IP.
- Despite the greater stability of the mangrove stand environments, our results showed that these areas have lower *Capitella* sp abundance than the adjacent sandflats (outside zones).

Capitella sp. x Mangrove roots biomass

- Could sedimentary differences within mangrove stands limit the occurrence of *Capitella* sp.?

and/or

- Could mangrove roots limit the occurrence of this species as result of physical constraints to infaunal organisms?



Thanks for your attention

ACKNOWLEDGEMENTS

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