Zooplankton biomass size spectra off Rio de Janeiro (Brazil) estimated by LOPC and ZooScan observations

Catarina Marcolin & Rubens Lopes
Introduction

Fundamental biological rates vary systematically with organism size (Baird & Suthers, 2007).

Trophic functions are maintained in the ecosystems along succession leading to characteristic and stable profiles of the organisms’ biomass size spectra (Kerr & Dickie, 2001).
Introduction

Biomass Size Spectra (BSS)  Important Index (Kerr & Dickie, 2001)

Population dynamics  Production

Laser Optical Plankton Counter (LOPC)  ZooScan

Treating organisms as particles...?

The integration between particles size and taxonomic data is not well done yet! Petchey & Belgrano, 2010.
Introduction

• Objectives:
  ◦ The aim of this study was to evaluate zooplankton abundance and biomass off Rio de Janeiro, Brazil using a LOPC and a ZooScan.
Material & Methods
Material & Methods

LOPC

Conical nets (200 µm)

ZooScan
Results

- LOPC: Abundance and Biomass x Particle Size.
Particles vertical profile

ST5

Total counts/m³

Counts/m³

Total Biomass/m³

Biomass/m³

Temperature

Salinity

Particles vertical profile

Depth (m)

0 20 40 60 80 100

0 2,0e+5 4,0e+5 6,0e+5 8,0e+5 1,0e+6 1,2e+6

14 16 18 20 22 24 26 28 30

35,4 35,6 35,8 36,0 36,2 36,4 36,6 36,8

3 5,4 5,6 5,8 6 6,2 6,4 6,6 6,8

14 16 18 20 22 24 26 28 30

35,4 35,6 35,8 36,0 36,2 36,4 36,6 36,8

3 5,4 5,6 5,8 6 6,2 6,4 6,6 6,8
Results

- ZooScan: Relative abundance

**350 - 1000 µm (700 µm)**

- Cnidaria
- Polychaeta
- Gastropoda
- *C. carinatus*
- *Temora spp.*
- Calanoida_NID
- *Oithona spp.*
- Corycaeidae
- Oncaeidae
- Chaetognatha
- Doliolida
- Appendicularia
- Others
Results

- **ZooScan: Relative biomass**

350 - 11000 µm (~1500 µm)

- Hydromedusae
- *A. hemistoma*
- Siphonophora
- Gastropoda
- *Temora spp.*
- *Calanoida_NID*
- *C. carinatus*
- Chaetognatha
- Doliolida
- Salpida
- Appendicularia
- Others
LOPC x ZooScan: Total density and total biomass.

Only particles >250 µm

Total Density

Total Biomass
NBSS

SLOPES
- LOPC: -0.92 to -0.70 (-0.83)
- ZooScan: -0.67 to -0.09 (-0.46)
Dominant groups in the spectra
Next Step...

- Include FlowCam analyzes from 50 µm net samples – who is 150-300 µm.

- To estimate which organism is where in the water column through the combination of these two data sets.
Conclusions

- Although size detection is not entirely coincident in these instruments, both the LOPC and the Zooscan provided useful and rapid results on the zooplankton vertical distribution in the study area.

- The combination of LOPC and ZooScan data has the potential to integrate taxonomy and size-based data in a quickly basis.