Food web characterization based on δ^{15}N and δ^{13}C reveals isotopic niche partitioning between fish and jellyfish in a relatively pristine ecosystem

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Table S1. Average isotopic values of ^{15}N and ^{13}C (standard deviation in brackets), and Carbon:Nitrogen ratios of primary producers, mesozooplankton, gelatinous zooplankton and nekton species collected along the 4 seasons, from April 2012 to January 2013, at Cananéia Lagoon Estuarine System. (-): no measurement; (*) values estimated from Barcellos et al. (2009)

<table>
<thead>
<tr>
<th>Primary producers</th>
<th>n</th>
<th>AUTUMN</th>
<th>WINTER</th>
<th>SPRING</th>
<th>SUMMER</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phytoplankton*</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Microphytobenthos*</td>
<td></td>
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<tr>
<td>Rhizopora mangle</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spartina alterniflora</td>
<td>3</td>
<td>4.61(0.09)</td>
<td>-27.86(0.46)</td>
<td>27.52</td>
<td>-</td>
</tr>
<tr>
<td>Enteromorpha sp.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zooplankton</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mollusca: Bivalve veliger</td>
<td>3</td>
<td>4.01(0.49)</td>
<td>-13.20(0.20)</td>
<td>17.60</td>
<td>-</td>
</tr>
<tr>
<td>Gastropod veliger</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Decapoda: Brachyura Zoeae</td>
<td>3</td>
<td>4.01(0.49)</td>
<td>-13.20(0.20)</td>
<td>17.60</td>
<td>-</td>
</tr>
<tr>
<td>Lucifer faxoni</td>
<td>2</td>
<td>8.26(1.14)</td>
<td>-16.79(0.28)</td>
<td>4.43</td>
<td>-</td>
</tr>
<tr>
<td>Dendrobranchiata:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pteros petrunkevitchi</td>
<td>3</td>
<td>10.19(0.39)</td>
<td>-17.38(0.21)</td>
<td>3.46</td>
<td>-</td>
</tr>
<tr>
<td>Cladocera: Penilia avirostris</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Polychaeta: Polychaeta larvae</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chaetognatha: Sagitta friderici</td>
<td>1</td>
<td>9.81</td>
<td>-19.16</td>
<td>3.74</td>
<td>2</td>
</tr>
<tr>
<td>Copepoda: Acartia lilljeborgi</td>
<td>4</td>
<td>8.64(0.29)</td>
<td>-18.32(0.46)</td>
<td>3.52</td>
<td>3</td>
</tr>
<tr>
<td>Corycaeus sp.</td>
<td>1</td>
<td>11.16</td>
<td>-19.42</td>
<td>4.36</td>
<td>-</td>
</tr>
<tr>
<td>Parvocalanus crassirostris</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Enteropina acutifrons</td>
<td>-</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Temora turbinata</td>
<td>1</td>
<td>7.33</td>
<td>-18.78</td>
<td>4.15</td>
<td>2</td>
</tr>
<tr>
<td>Vertebrata: Fish eggs</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Thaliaceae: Total mesozooplankton</td>
<td>7</td>
<td>8.63(0.90)</td>
<td>-17.73(0.13)</td>
<td>3.72</td>
<td>5</td>
</tr>
<tr>
<td>Cnidaria: Chiroplasma quadrumanus</td>
<td>-</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Taxon</td>
<td>Species</td>
<td>Length</td>
<td>Width</td>
<td>Height</td>
<td>Length_2</td>
</tr>
<tr>
<td>-----------------------------------</td>
<td>--------------------------</td>
<td>--------</td>
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<td>----------</td>
</tr>
</tbody>
</table>
Table S2. Population metrics (Layman et al. 2007) of the main jellyfish (in bold) and their potential competitors from the Cananéia Lagoon Estuarine System, grouped by clusters (see Fig 3). NR = $\delta^{15}$N range; CR = $\delta^{13}$C range; TA = convex hull total area ($\delta^2$ units); CD = mean distance to centroid; MNND = Mean Nearest Neighbor Distance; SDNND = standard deviation of mean nearest neighbor distance.

<table>
<thead>
<tr>
<th>Species</th>
<th>$\text{NR}$</th>
<th>$\text{CR}$</th>
<th>$\text{TA}$</th>
<th>$\text{CD}$</th>
<th>$\text{MNND}$</th>
<th>$\text{SDNND}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Olindias sambaquisensis (N=7)</td>
<td>5.07</td>
<td>2.77</td>
<td>5.93</td>
<td>1.59</td>
<td>0.92</td>
<td>0.52</td>
</tr>
<tr>
<td>Stellifer rastrifer (N=24)</td>
<td>1.61</td>
<td>2.50</td>
<td>3.93</td>
<td>0.90</td>
<td>0.28</td>
<td>0.16</td>
</tr>
<tr>
<td>Lolliguncula brevis (N=10)</td>
<td>2.20</td>
<td>3.24</td>
<td>4.30</td>
<td>0.97</td>
<td>0.69</td>
<td>0.39</td>
</tr>
<tr>
<td>Other consumers of B1 (Paralencncharus + Cathorops) (N=8)</td>
<td>3.39</td>
<td>2.65</td>
<td>4.28</td>
<td>1.35</td>
<td>0.64</td>
<td>0.49</td>
</tr>
<tr>
<td>Pellona harrowerri (N=4)</td>
<td>0.23</td>
<td>0.24</td>
<td>0.14</td>
<td>0.60</td>
<td>0.19</td>
<td>0.09</td>
</tr>
<tr>
<td>Lychnorhiza lucerna (N=30)</td>
<td>2.46</td>
<td>3.69</td>
<td>8.84</td>
<td>1.16</td>
<td>0.31</td>
<td>0.37</td>
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<tr>
<td>Chrysora lactea (N=17)</td>
<td>3.08</td>
<td>2.46</td>
<td>6.41</td>
<td>1.36</td>
<td>0.46</td>
<td>0.30</td>
</tr>
<tr>
<td>Chlroscombrus chrysurus (N=16)</td>
<td>2.16</td>
<td>3.23</td>
<td>4.43</td>
<td>1.07</td>
<td>0.44</td>
<td>0.31</td>
</tr>
<tr>
<td>Genidens genidens (N=10)</td>
<td>2.68</td>
<td>2.69</td>
<td>4.14</td>
<td>1.32</td>
<td>0.55</td>
<td>0.23</td>
</tr>
<tr>
<td>Achirus lineatus (N=12)</td>
<td>3.45</td>
<td>2.31</td>
<td>6.13</td>
<td>1.41</td>
<td>0.63</td>
<td>0.34</td>
</tr>
<tr>
<td>Peisos petrunkevitchi (N=6)</td>
<td>1.68</td>
<td>2.74</td>
<td>1.74</td>
<td>0.87</td>
<td>0.67</td>
<td>0.75</td>
</tr>
<tr>
<td>Mnemiopsis leidyi (N=22)</td>
<td>2.07</td>
<td>3.80</td>
<td>6.42</td>
<td>0.99</td>
<td>0.45</td>
<td>0.32</td>
</tr>
</tbody>
</table>

Fig. S1. Relationships between body size (cm) (as bell diameter, for medusae, oral-aboral length for the ctenophore Mnemiopsis leidyi, total body length for fish and the shrimp Xiphopenaeus kroyeri, and carapace length for the crab Callinectes danaei) and trophic level (as $\delta^{15}$N), of gelatinous zooplankton*, fish ** and crustaceans ***
LITERATURE CITED
