ABSTRACT

This study was undertaken to characterise the community of important gelatinous predators in the zooplankton, in the shelf waters, off the south coast of Jamaica. It was also important to obtain estimates of production for these animals in order to understand their role in the transfer of energy through the tropical, planktonic food web.

To meet these objectives, sampling was conducted fortnightly, at two sites, (at the mouth of Kingston Harbour and off Lime Cay), off Port Royal, Jamaica. Using a 600-µm net, samples were collected from September 1992 to December 1993, inclusively. Ctenophores (Ctenophora) were identified and enumerated from unpreserved samples. Medusae (Cnidaria) were processed from the same samples, preserved in 10% formalin.

The community of ctenophores was similar at both sites. They included *Bolionopsis vitrea*, *Beroe* sp. and *Ocryopsis crystallina*. *Bolionopsis vitrea* was the dominant ctenophore at both sites.

Nine species of medusae were identified from the mouth of Kingston Harbour, while eight were identified from Lime Cay. The community at the Harbour mouth was dominated by *Eutima gracilis*, (average daily abundance 3.97 animals m^{-3}), *Liriope* spp., (3.48 animals m^{-3}) and "Medusa M" (2.38 animals m^{-3}). However, the community at Lime Cay was dominated, almost equally, by *Phialidium* sp., (1.19

animals m^{-3}) and *Liriope* spp. (1.17 animals m^{-3}). As expected, abundances were higher at the mouth of the Kingston than off Lime Cay. No obvious seasonal trends or distributional patterns were observed at either site.

Size- frequency histograms were generated for selected species from both sites. Generally, the distribution (of sizes) of ctenophores was positively skewed. This trend was observed at both sampling stations. On the other hand, the distributions of medusae were generally normal. The modes varied widely between species. Also, frequently, the modes of one species varied over the annual cycle, (for example *Cladonema* sp. at the mouth of Kingston Harbour and *Liriope* spp. at Lime Cay).

Size-mass regressions were established for each of the three species of ctenophores, as well as, three representative species of medusae: *Eutima gracilis*, *Liriope* spp. and *Phialidium* sp. These regressions were applied on an individual basis and used in biomass and production calculations. Adjusted r^2 values for these regressions ranged from 0.605 to 0.97.

In terms of biomass, *Bolionopsis vitrea*, was again the most important ctenophore at both sites, over the annual cycle. Biomass of this ctenophore peaked at 0.092 KJ m^{-3}, at the mouth of Kingston Harbour and 0.046 KJ m^{-3} at Lime Cay. Biomass of medusae at the mouth of Kingston Harbour was dominated by *Eutima gracilis* and *Liriope* spp., (peaks of 0.38 and 0.22 KJ m^{-3}, respectively). The

biomass of the medusae at Lime Cay was dominated mainly by *Liriope* spp. (0.045 KJ m^{-3}). As expected, the biomass of these gelatinous predators at Lime Cay was lower than the community at the mouth of the harbour. Biomasses at both sites varied over the sampling period, with no obvious seasonal patterns.

Growth rate experiments were conducted using the ctenophore: *Bolonopsis vitrea* and three medusae species: *Liriope* spp., *Phialidium* sp. and *Eutima gracilis*. Growth rates were reported as "g" (coefficient of instantaneous growth). For pooled data, (negative and zero growth rates excluded), "g" ranged from 0.025-1.95. For this pool of data, size was found to account for 53.1% of the variations in the growth rates. In addition to this, size-growth regressions were established for *Bolionopsis vitrea* (and used for all the ctenophores) and the three medusae species, (from pooled data, and used for all medusae species).

Following the previously described trends, *Bolionopsis vitrea*, was the most productive ctenophore at both sampling stations. Annual production of this ctenophore peaked at 0.032 KJ m^{-3} and 0.015 KJ m^{-3}, at the mouth of Kingston Harbour and Lime Cay, respectively. On the other hand, the dominant species of medusae varied from site to site. In terms of production, *Eutima gracilis* dominated at the mouth of Kingston Harbour. *Liriope* spp. were the dominant medusae at Lime Cay. Overall, production of the gelatinous, carnivorous communities was dominated by the medusae. This was observed at both sites. Annual production of gelatinous, carnivorous zooplankton

at the mouth of Kingston Harbour was 13.87 KJ m^{-3} yr^{-1}. That at Lime Cay was 2.53 KJ m^{-3} yr^{-1}. In a previous study at Lime Cay, Clarke (1988), estimated the annual production of the Ctenophora and Cnidaria as 5.94 KJ m^{-3} yr^{-1} (2.14 KJ m^{-3} yr^{-1} and 3.80 KJ m^{-3} yr^{-1} respectively). She, however, concluded that this (calculated) production estimate was too high or the carnivores were obtaining energy from sources other than the herbivores.