Diel vertical distribution and life history characteristics of Tropodiaptomus simplex and its importance in the diet of Stolothrissa tanganicae, Kigoma, Tanzania.

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Abstract

Tropocyclops simplex abundance, diel distribution and the impact of the planktivore fish Stolothrissa tanganicae on the T. simplex population were studied at a deep-water site in Kigoma Bay, Lake Tanganyika during the wet period (October 2008–February 2009). The top 40 m were examined using discrete depth samples, filtered through a 40-µm mesh. Ovigerous and copepodids of Tropodiaptomus simplex exhibited a very clear diel vertical migration. Ovigerous females of Tropodiaptomus were negligibly low in the 0–30 m depth during the day, while at night they stayed above 20 m. Tropodiaptomus nauplii did not show any clear diel vertical migration. The contribution of adults, copepodite and nauplii stages to the total numbers of Tropodiaptomus simplex was 8.2, 8.6 and 83.2%, respectively. Stolothrissa tanganicae stomachs were analysed to quantify the contribution of zooplankton in their diets, which revealed a dominance of Tropodiaptomus females and the electivity indices proved that T. simplex females (with or without eggs) were highly selected by S. tanganicae, which could probably be explained by size-selective feeding. Life table analysis indicated that approximately 60% of T. simplex nauplii did not develop into copepodites, a loss which could not be explained by the results of the present study. 68% of the fish gut contents were contributed by female Tropodiaptomus individuals and the contribution of shrimps and Cyclopidae increased substantially to almost 20%. S. tanganicae consumed largely ovigerous Tropodiaptomus females. However, eggs found in the guts were significantly smaller than those found in the zooplankton discrete samples, suggesting that digestion had started. The calculated electivity indices underline that ovigerous and non ovigerous females of T. simplex are being positively selected in the feeding process. It infers existence of selective predation in L. Tanganyika by S. tanganicae on females of T. simplex (with or without eggs) and as a result distinct vertical migration as a predation escape mechanism is performed.

Key Word Tropodiaptomus, simplex, Stolothrissa