Temporal variability and production of *Euterpina acutifrons* (Copepoda: Harpacticoida) in the Cananéia Lagoon estuarine system, São Paulo, Brazil

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**Key words:** *Euterpina acutifrons*, temporal variability, population structure, biomass, production rate, Cananéia Lagoon estuarine system

**Abstract**

Diel and seasonal variations in abundance, population structure, biomass and production rate of the harpacticoid copepod *Euterpina acutifrons* were studied in the Cananéia Lagoon estuarine system, São Paulo, Brazil. Zooplankton samples were collected at 4-h intervals during multiple 24-h periods, from February 1995 to January 1996. Copepodites and adults of *E. acutifrons* were present in the plankton throughout the year (temperature, 18.6–29.4 °C; salinity, 4.5–33.0 psu; chlorophyll-α concentration, 1.32–20.42 μg l⁻¹). Abundance of *E. acutifrons* showed considerable diel variations. On most sampling dates, higher abundances were recorded at times when salinity was higher. Biomass varied from $0.044 \pm 0.046$ (daily mean ± SD) to $5.264 \pm 3.425$ mg C m⁻³. The estimated production rates (minimum ± SD–maximum ± SD) were $0.034 \pm 0.035 – 4.95 \pm 3.25$ (Ikeda-Motoda model), $0.035 \pm 0.036 – 5.123 \pm 3.347$ (Huntley-Lopez model), and $0.016 \pm 0.017 – 2.101 \pm 1.372$ mg C m⁻³ d⁻¹ (Hirst-Sheader model).

**Introduction**

The harpacticoid copepod *Euterpina acutifrons* (Dana) is widely distributed in coastal, shelf and oceanic waters of the world, except in the Antarctic and Arctic Oceans (Lang, 1948). Although *E. acutifrons* survives in a wide range of temperature and salinity, its densest populations have been found in estuaries and coastal waters, rather than offshore waters (Björnberg, 1963).

Several aspects of the biology and ecology of *E. acutifrons* have been studied, e.g. morphological characteristics of the developmental stages (Rao, 1958; Haq, 1965; Fanta, 1972; Goswami, 1975; Björnberg, 1981), dimorphism in males (Haq, 1965, 1972, 1973; Stancyk & Moreira, 1988), seasonal variation in abundance (D’Apolito & Stancyk, 1979; Moreira et al., 1983; Moreira & McNamara, 1984; Viñas & Gaudy, 1996; Ara, 1998), population structure (D’Apolito & Stancyk, 1979; Moreira et al., 1983; Ara, 1998), temperature and/or salinity tolerance (Tundisi & Matsumura-Tundisi, 1968; Moreira et al., 1982), respiration rate (Moreira & Vernberg, 1968, 1978; Moreira & Yamashita, 1973; Vernberg & Moreira, 1974; Moreira, 1975, 1986), fecundity (Nassogne, 1970; Haq, 1972; Zurlini et al., 1978; D’Apolito & Stancyk, 1979; Guisande et al., 1996; Hopcroft & Roff, 1996, 1998), feeding rate (Nassogne, 1970; Sautour & Castel, 1998), growth and development rates (Bernard, 1963; Neunes & Pongolini, 1965; Haq, 1972; Zurlini et al., 1978; D’Apolito & Stancyk, 1979; Zurlini & Ferrari, 1979; Sciandra, 1986; Carlotti & Sciandra, 1989), length-weight relationships and chemical content (Ara, 1998), and population dynamics models under experimental conditions (Sciandra, 1986; Carlotti & Sciandra, 1989; Carlotti & Nival, 1992). The nutritional value of this species as prey for some economically important fishes has been assessed as well (Kraul et al., 1993; Viñas & Ramírez, 1996). However, the only detailed study on the production rate of *E. acutifrons* performed to date is that...

The aim of this study was to obtain quantitative information on temporal variations in abundance, biomass, population structure and production rate of *E. acutifrons*, in relation to basic environmental variables, in the Cananéia Lagoon estuarine system, a subtropical mangrove-surrounded estuary located in southeastern Brazil.

**Materials and methods**

Field investigations were carried out at a fixed sampling station (25° 01’ 11” S, 47° 55’ 43” W, 10–12 m depth, depending on tides) situated in Mar de Cananéia (Fig. 1), at 4-h intervals during multiple 24-h periods, from February 1995 to January 1996. Plankton samples were collected by vertical hauls of a plankton net (50 cm in mouth diameter, 150 μm in mesh size), equipped with a flowmeter, from near the