The diel vertical migration pattern of the copepods, *Acartia tonsa* and *Paracalanus parvus* was studied in Guanabara Bay, Brazil. Samples were taken at a fixed station at three depths, at three-hour intervals, and for three days. During the study period, the water column was stratified with warm, low-salinity water from the inner bay at the surface and cold, high-salinity deep-ocean water below. The individuals of both species were identified and counted, with no sex or stage distinction. The results confirmed that *A. tonsa* and *P. parvus* have a different migratory behaviour. *A. tonsa* maintains itself in the surface water layer during the night. This species does not seem to be affected by the presence of a sharp thermocline. *P. parvus* shows a vertical migration pattern based on a 12-hour cycle and it is limited to deeper waters, below the thermocline. This peculiar behaviour may help *P. parvus* to avoid being carried into the inner, polluted part of the bay.

RÉSUMÉ

INTRODUCTION

_Acartia tonsa_ Dana, 1849 and _Paracalanus parvus_ (Claus, 1863) are common copepods in the coastal waters of southeastern Brazil. Both species contribute importantly to the mesozooplankton biomass of local ecosystems, such as the Cabo Frio upwelling zone (W. Monteiro-Ribas, pers. comm.) and Guanabara Bay (Machado, 2002). Guanabara Bay is a eutrophic, tropical system that is highly polluted in its inner region. The bay receives a strong discharge of continental waters during low tides and also during the rainy season, giving it estuarine characteristics. Tides are mixed with a range of 0.7 m. Tidal currents reach 0.5 m.s$^{-1}$ inside the bay and 1.6 m.s$^{-1}$ near the bay entrance. The bay has mean salinities from 21.0 to 34.5‰. Untreated sewage runoff results locally in poor water quality, indicated by an average faecal coliform of 1140 counts.ml$^{-1}$, low dissolved oxygen values (< 2.0 mg.l$^{-1}$) and excessive ammonia and phosphate loading. The chlorophyll concentration in this inner region exceeds 130 µg.l$^{-1}$ (Kjerfve et al., 1997). During high tides, a bottom wedge of Atlantic Ocean water penetrates into the bay. This water is influenced by deep water from the Cabo Frio upwelling, mainly during spring and summer when the upwelling is most intense (Valentin, 1988).

Therefore, a strong, both thermal and saline gradient develops in the entrance and in the central part of the bay during spring and summer, because of the superposition of two different water masses. A warm, low-salinity, eutrophic surface water layer (0-10 m), originating from the inner bay, overlies a deep cold layer, from the upwelling of the South Atlantic Central Water (SACW) in the Cabo Frio region about 100 km to the east (Valentin, 1984).

Previous studies on Guanabara Bay have shown that mesozooplankters reach high population densities near the bay entrance (approx. 11000 ind.m$^{-3}$; Schutze, 1987; Nogueira et al., 1988). These populations decrease sharply (to approx. 4500 ind.m$^{-3}$; Schutze, 1987; Nogueira et al., 1988) and almost disappear towards the more polluted parts (Sevrin-Reyssac et al., 1979; Marazzo & Nogueira, 1996). A singular fact observed during these early studies is the different distribution of the two dominant copepod species, _Acartia tonsa_ and _Paracalanus parvus_. _P. parvus_ has almost disappeared from the inner part of the bay, whereas _A. tonsa_ is one of the few mesozooplankters to persist there in reasonably high proportions (33.5% of total mesozooplankton, against 5.5% for _P. parvus_; Machado, 2002) in all regions. According to the literature, _A. tonsa_ is found in coastal and estuarine waters worldwide, especially in tropical, subtropical, and warm-temperate waters. It is dominant in marine coastal areas and lagoons (Conover, 1956; Cervetto et al., 1995). According to previous observations, this species appears capable of adapting and surviving in the unfavourable conditions of a polluted bay. On the