

Diurnal pelagic swimming activity of *Pontoporeia* — a waste of energy?

Hans Cederwall

Askö Laboratory, University of Stockholm, S-106 91 Stockholm, Sweden

As long ago as 1927 Hessle & Vallin found *Pontoporeia* in zooplankton samples from the Baltic proper, as far as 300 m above the bottom. Segerstråle also found them in pelagic samples, even in the uppermost part (10 m) of the zone. He encountered no *Pontoporeia* in his daytime samples and therefore concluded that *Pontoporeia* species were only active at night.

Several experimental studies on the diurnal activity of *Pontoporeia* species have confirmed that they are active at nighttime. These experiments, however, have not been constructed to show to what extent the animals swim far above the bottom. Swimming just above the bottom can be recognised as an activity connected with the search for food.

Recently, Bongo-net trawlings have shown that this activity occurs at all seasons and cannot therefore be related to mating activity, as has been suggested. In fact, over seventy times more specimens were found during early summer than during late autumn, the latter being the mating season in *Pontoporeia*.

Vertical migrations have also been shown for the American form of *P. affinis*, and according to Marzolf only 7% of his population took part in vertical migrations.

There must be a logical explanation for this swimming activity if we are convinced that Nature does not waste energy. Several hypotheses, e.g. mating behaviour, and to increase gene flow, search for food or avoid predation, are discussed in this paper in the light of earlier knowledge and the recent results from Bongo-net trawlings.

Anger & Valentin have shown that only 10% of a population of *Distylis rathkei* took part in the nocturnal swimming activity, and that all these individuals were moulting. Nocturnal swimming activity is believed to be a way of escaping predation during periods of acute vulnerability. It seems quite reasonable to assume that recourse to the same behaviour is made by *Pontoporeia* species.