

Istituto Sperimentale Talassografico "Attilio Cerruti", TARANTO (Italy)

Many authors have used marine zooplankton in acute or chronic toxicity tests. In particular there is a large literature concerning toxicity tests with copepods (see WELLS, 1984 for a review). Their sensitivity to toxic compounds is important because they are the main component of the zooplankton. A number of studies have addressed the question of how high concentrations of toxic substances affect juvenile stages (SULLIVAN and RITACCO, 1985). However, in the aquatic environment, pollutants occur at lower concentrations than those generally used for toxicity tests. For this reason, some authors observed response to sublethal toxicant doses, such as growth and mortality rates, and used these data to interpret chronic bioassays (ALLAN and DANIELS, 1982).

In our study, we chose the neritic calanoid copepod *Acartia clausi*, typical in Mediterranean coastal waters, for a toxicity test. The aim of this work was to control if reproductive rates, mortality and feeding activity were modified by exposing *A. clausi* females to phenol pollutant with respect to control populations. This compound was chosen because it is an ubiquitous environmental contaminant typical of many industrial wastes. Phenol is remarkably important as it is part of the production cycle of many chemical industries, in particular the oil industry. Many studies on acute toxicity have been conducted on fish, but only a few authors have analyzed phenol chronic toxicity on marine zooplankton and, in particular, on copepods (BUTTINO *et al.*, 1991).

We present here preliminary results of reproductive rates, feeding activity (expressed as fecal pellets production) and mortality rates of *A. clausi* females exposed to 500 $\mu\text{g}/\text{l}$ phenol concentration.

Eighty adult females were collected in the Mar Grande in Taranto. Forty females were sorted individually in 60 ml crystallizers with 20 ml sea water filtered through a 45 μm mesh net and 30 ml of a mixture of food cells *Prorocentrum minimum* and *Phaeodactylum tricorutum* and forty females were taken in the same conditions but with phenol solution added to a final concentration of 500 $\mu\text{g}/\text{l}$.

Comparison among fiducial intervals ($P=0.05$) shows that there are not significant differences in reproductive rates between phenol-exposed females and control ones, until the eighth day (Fig.1A). Mean fecal pellet production showed lower values for phenol-exposed females only on the ninth and tenth day (Fig.1B). There were no differences between spawning and non-spawning females. *Acartia clausi* showed a great resistance to phenol as reported by KUYPER and HANSTVEIT in an *in situ* study (1984).

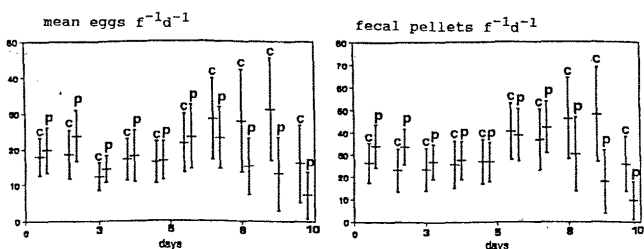


Fig.1 : Confidence intervals (95%) for phenol-exposed females (p) and control ones (c).
A: Mean egg production rates; B: Mean fecal pellets production.

REFERENCES

- ALLAN J.D. and DANIELS R.E., 1982.- Life table evaluation of chronic exposure of *Eurytemora affinis* (Copepoda) to kepone. *Mar. Biol.* 66: 179-184.
 BUTTINO I., FILIPPI M. e CARDELLICCHIO N., 1991.- Tossicità dei composti fenolici nell'ambiente marino. *Acqua Aria*, 9: 853-861.
 KUYPER J. and HANSTVEIT A.O., 1984.- Fate and effects of 4-chlorophenol and 2,4 dichlorophenol in marine plankton communities in experimental enclosures. *Ecotox. Environ. Safety*, 8: 15-33.
 SULLIVAN B.K. and RITACCO P.J., 1985.- Ammonia toxicity to larval copepods in eutrophic marine ecosystems: a comparison of results from bioassays and enclosed experimental ecosystems. *Aquatic Toxicology*, 7: 205-217.
 WELLS P.G., 1984.- Marine ecotoxicological tests with zooplankton. In: *Ecotoxicological testing for the marine environment*. G. Persoone, E. Jaspers, and C. Claus Eds. State Univ. Ghent and Inst. Mar. Scient. Res., Bredene, Belgium. Vol. 1: 215-256.