DYNAMICS OF PARACARTIA SPECIES (CALANOIDA: COPEPODA) IN TWO PONDS OF THE SFAX SALTERN (TUNISIA) IN RELATION TO SALINITY

N. Annabi-trabelsi [1]*, R. Kobbi [1], W. Guermazi [1], G. Belmonte [2] and H. Ayadi [1]

[1] Université de Sfax, Faculté des Sciences de Sfax, Département des Sciences de la Vie. Unité de recherche UR/05ES05 Biodiversité et Ecosystème Aquatiques - neilaannabi@yahoo.fr

[2] Laboratory of Zoogeography and Fauna, Department of Biological and Technological Sciences and Technologies, University of Salento, 73100 Lecce, Italy

Abstract

The purpose of this work was to study the dynamics of two *Paracartia* species in two ponds in the Sfax saltern: A1 (salinity: 50.44±7.12) and A16 (71.51±13.46).*Paracartia latisetosa* and *P. grani* showed different population dynamics at the two different sites, but the influence of salinity could be ignored.

Keywords: Salinity, Brackish Water

Introduction

Paracartia latisetosa and *P. grani* are present in Sfax saltern. P. latisetosa is a seasonally dominant copepod species in northern Tunisian coastal waters [1]. P. grani is typical of highly turbid semi-enclosed systems in which food is often unavailable [2]. The aim of this work was to compare dynamics of this two species in two ponds of different salinity.

Material and methods

The Sfax solar saltern is located in the central-eastern coast of Sfax (Tunisia, 34° 390 0.100 N and 10° 420 3500 E). It is a confined ecosystem (sensu [3]) with evaporation exceeding water import. Sampling was carried out monthly from September 2007 to August 2008 in ponds A1 and A16. The zooplankton was collected by filtering 50l of water through 50 µm-mesh net, then transferred to a sterile 125 ml flask, and fixed with formaldehyde (5% final concentration) for further quantitative and qualitative analyses.

Results and discussions

The two ponds differed in the salt concentration. Salinity varied from 41.80 to 62.20 ‰ at A1 (average, 50.44 ± 7.12‰) and from 50.20 to 98.00‰ at A16 (average 71.51 ± 13.46‰). Temperatures were not greatly different in both ponds. They ranged from 11.50 to 29.00° C at A1 (average, 20.71±5.57° C) and from 12.50 to 30.00° C at A16 (average, 20.91±5.86° C).

The population density of *P. latisetosa* was higher in A16, whilst the population density of *P. grani* was higher in A1 (table. 1).

Tab. 1. Average annual abundances of *P. latisetosa* and *P. grani* (adult specimens) in two ponds (A1 and A16) of Sfax salt works

	A1	A16
P. latisetosa (× 10^3ind. m^{-3})	1.232	2.161
P. grani (× 10^3 ind. m^{-3})	5.135	2.915

At pond A1 total copepods abundance positively correlated with Salinity (r = 0,840), and negatively correlated with temperature (r = -0,610). At pond A16, total copepod and single species abundances did not correlate significantly with Salinity. Monthly abundance fluctuations of both species were different in both ponds (Fig. 1). *P. grani* was absent for 7 months in A16, and only 1 month in A1. *P. latisetosa* was absent for 6 and 4 months in A1 and A16 respectively.

Acartiidae are typical resting egg producers in confined areas [4]. *P. latisetosa* is well-known for the production of diapause eggs which allow it to over-winter [5], but the species was absent from the water column of both basins also from April to June 2008. Also *P. grani* is known to produce resting eggs [6]. Hence the intermittent population of these species is affected by the hatch of eggs, rather than by the development rate of juveniles under different salinity conditions. *Paracartia grani* drastically diminishes its abundance from A1 to A16. Notwithstanding, both ponds saw a demographic prevalence of that species. In A16, in fact, P. grani is only slightly more numerous than *P. latisetosa* which here shows an opposite trend, being more abundant than in A1. *P. latisetosa*, whose demographic growth seems to be directly correlated with Salinity in the two salt works studied, is also a typically brackish water species. Apart from features which interact in affecting the species reciprocal affirmation in such extreme environments, it emerges clearly that salinity could not be considered as the driving condition in assessing the *Paracartia* populations in confined environments**.**

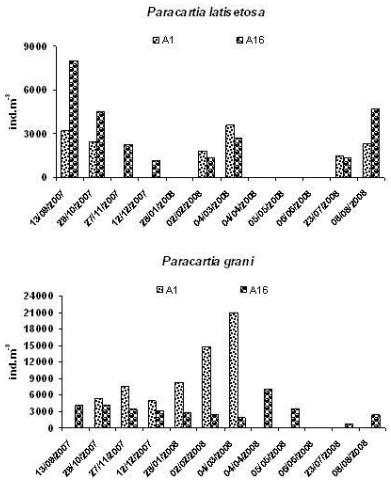

Fig. 1. Monthly variations of *Paracartia latisetosa* and *Paracartia grani* in Sfax salt works

References

1 - Annabi-Trabelsi, N., M.N. Daly-Yahia, M.S. Romdhane, & N.Ben Maïz., 2006. Seasonal variability of planktonic copepods in Tunis North Lagoon (Tunisia, North Africa). *Cah Biol. Mar*., 46, 325-333.

2 - Calbet A, E Saiz, X Irigoien, M Alcaraz, and I Trepat., 1999. Food availability and diel feeding rhythms in the marine copepods *Acartia grani* and *Centropages typicus J. Plankton Res*. 21: 1009-1015.

3 - Guelorget 0. and Perthuisot J.-P., 1992. Paralic ecosystems – Biological organization and functionning. Vie Milieu, vol. 42: 215-251.

4 - Mauchline J., 1998. The biology of calanoid copepods, Advances in Marine Biology 33: 710 pp.

5 - Belmonte G. and A. C. Pati., 2007. Hatching rate and diapause duration in eggs of *Paracartia latisetosa* (Copepoda: Calanoida). *J. Plankton Res* 29: 39-47.

6 - Guerrero F. and Rodriguez V., 1998. Existence and significance of *Acartia grani* resting eggs (Copepoda: Calanoida) in sediments of a coastal station in the Alboran Sea (SE Spain). *J. Plankton Res*., 20: 305-314.