

# Characterization of the zooplankton community of three peridunars ponds with different hydroperiod in L'Albufera Natural Park (Valencia, Spain)

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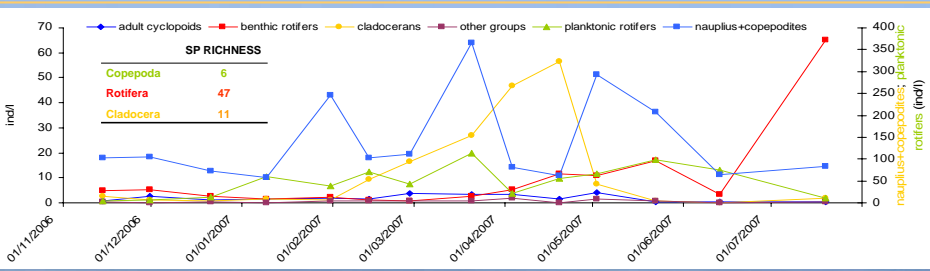
## Introduction

"Malladas" is the local name for small and shallow peridunars ponds in the area of L'Albufera Natural Park (Valencia, Spain). In the seventies most of them were dried out and some were covered with ground, but in recent years, a process of restoration has been carried out in some of these ponds. They are mainly filled with rain and ground water showing notorious differences in their hydroperiod. Moreover, some of them were dug to be permanent ponds throughout the year. Our aim was to compare the zooplankton community in three of these ponds with different hydroperiod.

## Study site and methods

We selected a permanent pond, **Mata del Fang**, with a maximum depth around 2 m (1,5 m in summer) and two temporary ponds: **Quarter del Guano** (max. depth 50 cm) with long hydroperiod and **Malladeta** (max. depth 20 cm) with short hydroperiod. Mata del Fang is used as reserve for the endangered species *Aphanius iberus* a small cyprinodont fish. We sampled the ponds fortnightly from November 2006 to July 2007. We measured conductivity, pH, temperature and dissolved oxygen, and we took water samples to analyze nutrients and chlorophyll a concentration. At the same time, we took quantitative zooplankton samples, using a 35 µm mesh-size filter.

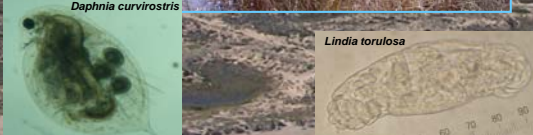
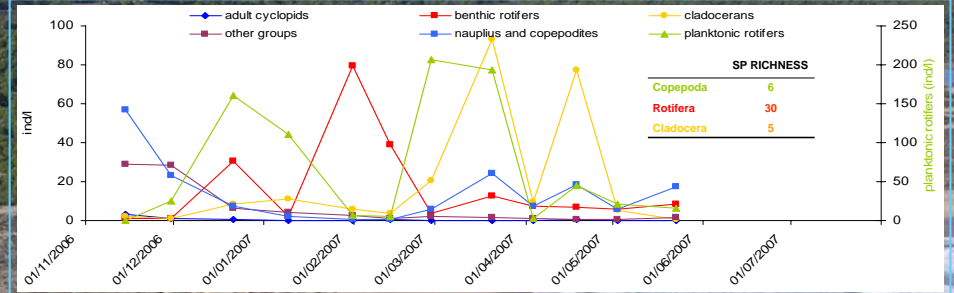
## Results



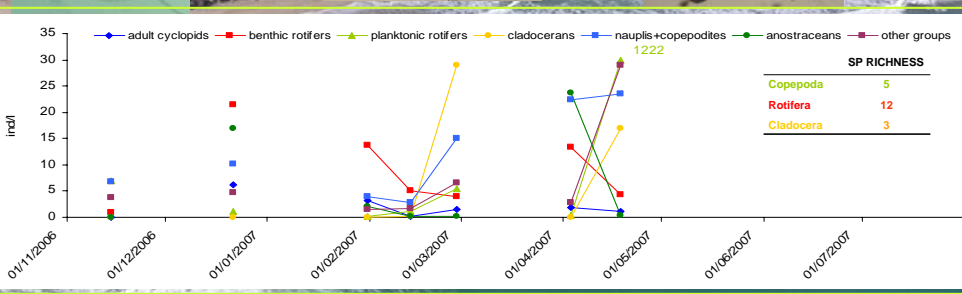
**Mata del fang**  
 This permanent pond was dominated by young stages of cycloids. Planktonic rotifers were also abundant (mainly *Hexarthra fennica*, *Keratella tropica*, *Polyarthra dolichoptera* and *Synchaeta pectinata*). 11 cladoceran species were identified: *Daphnia magna* was dominant but also appeared species from the genus *Alona*, *Chydorus*, *Pleuroxus*, *Ceriodaphnia*, *Simoccephalus*, *Machrotrix* and *Scapholeberis*. We found many species of benthic rotifers (including 12 *Lecane* spp.). We also found ostracods, insect larvae (chironomidae, ephemeroptera and corixidae), acari and tardigrada.



**Quarter**  
 This pond had a maximum depth in April, and dried out very quickly in June. The most abundant group were the planktonic rotifers, mainly *H. fennica* and *P. dolichoptera*. Cladocerans were abundant in spring; we found 5 species, the dominant were *Daphnia curvirostris* and *C. sphaericus*. *Lepadella patella* was the benthic rotifer with the highest density. We found 5 different cyclopid species and one calanoid. Other groups in this pond were ostracods, turbellaria, insecta (ephemeroptera, chironomidae, odonata, corixidae and coleoptera), collembola and acari.



**Malladeta**  
 This pond was always very shallow and intermitently flooded and presented only two flooding periods longer than a month. There were marked changes in the composition and abundance of zooplankton species. The densities were lower than in the other ponds, except for planktonic rotifers (dominant group at the end of the period, *H. fennica* 1222 ind/l). Benthic rotifers (*Lindia torulosa* and *Boedeltje*) and cladocerans (mainly *D. magna*, but also *Alona rectangula* and *Mama macrocopus*) were the most abundant groups most of the time. This was the only pond where anostraceans (*Tanymastix stagnalis*) appeared. Ostracods were important at the end of April (Cyprididae), and other groups that appeared were insect larvae (chironomidae, corixidae, ephemeroptera and other dipters), oligochaeta and collembola.



## CONCLUSIONS

- ✓ These ponds were quite similar in their limnological characteristics, although they showed marked differences in their hydroperiod.
- ✓ In all these ponds the group with the highest species richness were rotifers > cladocerans > copepods.
- ✓ In most zooplankton groups, specific richness increased with hydroperiod length but this pattern is more marked in rotifers and less in copepods. Anostraca only appeared in the pond with short hydroperiod.
- ✓ The hydroperiod seems to be a very important factor influencing the structure of the zooplankton community, particularly in these shallow peridunars ponds.

	Mata del fang	Quarter	Malladeta
hydroperiod	permanent	long	short
Conductivity (mS/cm)	1,8 ± 0,2	1,5 ± 0,3	1,2 ± 0,5
Temperature (°C)	17,8 ± 5,5	15,9 ± 4,6	16,4 ± 4,9
pH	8,7 ± 0,3	8,2 ± 0,3	8,6 ± 0,3
Oxygen (mg/l)	9,3 ± 2,4	8,9 ± 1,4	8,5 ± 2,0
Chl-a (µg/l)	1,80 ± 1,68	1,40 ± 1,97	2,33 ± 0,97
Dissolved N (mg/l)	0,29 ± 0,17	0,30 ± 0,07	0,30 ± 0,21
Dissolved P (mg/l)	0,03 ± 0,01	0,03 ± 0,08	0,06 ± 0,01

Averaged values from the hydrological cycle Nov 2006-Jul 2007 for some environmental variables of the three studied ponds.