

Distribution of large branchiopods in Murcia Region (SE Spain): the role of farm ponds as important habitats for their conservation

David Verdiell Cubedo¹ & Dani Boix Masafret²

¹Asociación Columbares. C/ Adrián Viudes, nº 9. 30570, Murcia, España (verdiell@um.es)

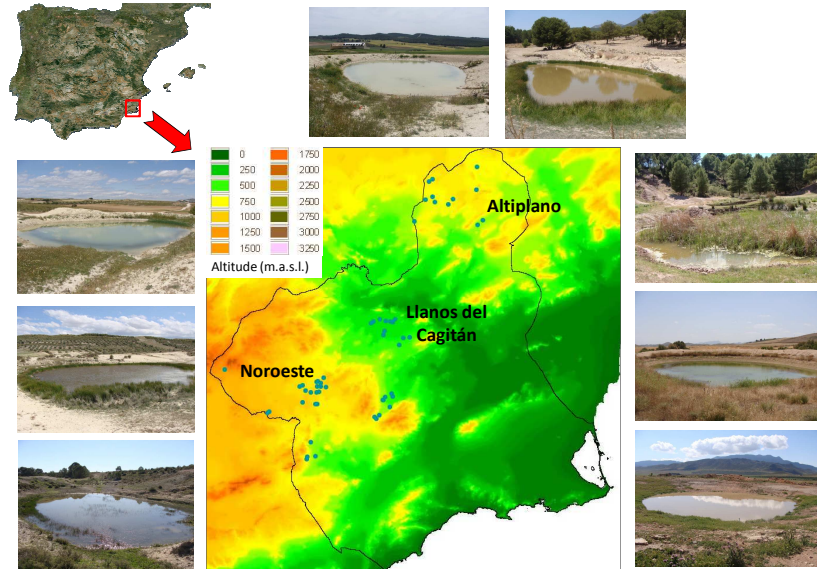
²Instituto de Ecología Acuática. Facultad de Ciencias. Universidad de Girona. 17071, Girona, España (dani.boix@udg.edu)

INTRODUCTION AND STUDY AREA

Farm ponds are temporary aquatic systems related to traditional agricultural practices. These man-made ponds act as small wetlands that significantly contributed to the conservation of freshwater biodiversity in agricultural landscapes [1, 2].

The Region of Murcia is located in a semiarid climate area, where natural freshwater bodies are scarce. As in other Mediterranean regions the expansion and intensification of agriculture have caused the loss of natural wetlands. Nevertheless, farm ponds present in Murcia Region constitute alternative aquatic habitats which might act as relevant habitats for the conservation of freshwater biodiversity [3].

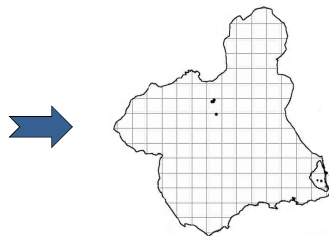
This study presents the occurrence of large branchiopods species (orders Anostraca and Notostraca), during a survey of 57 temporal freshwater ponds belonging to the farm ponds type according the Regional Inventory of Wetlands in Murcia [4]. Sampling was conducted during 2012 and 2013 from February to September, and the specimens were captured with the use of a hand net (4 mm mesh size). Samples were preserved in a 70% ethanol solution and identified at species level in the laboratory.



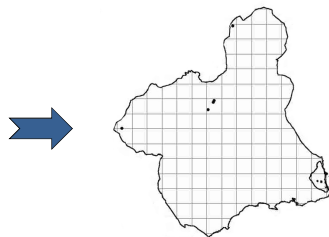
RESULTS AND DISCUSSION



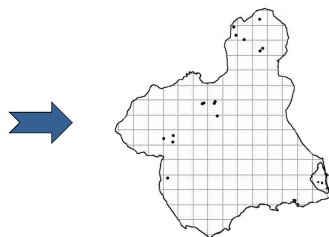
Triops cancrivormis/simplex



Branchipus schaefferi



Streptocephalus torvicornis



Three species were detected in the present study: the anostracans *Branchipus schaefferi* and *Streptocephalus torvicornis*, and the notostracan *Triops cancrivormis/simplex*. The most widely distributed species was *S. torvicornis* which was present at 15 localities distributed through 9 UTM 10 x 10 km grids. The presence of *B. schaefferi* was recorded at 5 sites through 3 UTM grids. These results could be related with differences in niche breath between both species, due to *B. schaefferi* is a generalist species and *S. torvicornis* is a specialist species which has narrower niche breath [5], situation that could be indicative that the studied farm ponds are particular and well preserved habitats. Regarding the notostracan *T. cancrivormis/simplex*, its distribution was much more restricted than the previous ones and it was only present at 4 ponds in 2 adjacent UTM grids. It should be noted that the distribution of these species could be much wider in Murcia Region, due to the high temporal variability of the water bodies in which they proliferate and the ephemeral nature of their life cycle, a fact which greatly hinders their detection. Most of the surveyed ponds only had one species, but in some farm ponds a higher coexistence level were observed.

In the Region of Murcia farm ponds contribute greatly to the maintenance of regional biodiversity, although a large number of them are in a precarious conservation conditions, mainly due to the abandonment of traditional agricultural practices [3]. The high occurrence of large branquiopods in these systems puts in evidence the importance of farm ponds for this animal group where natural temporary ponds are scarce. Therefore, consideration should be given to establish a figure of exclusive protection for these aquatic systems of small entity and it would be highly recommended the creation of a network of protected ponds to ensure the maintenance of biodiversity associated with these aquatic systems, including the species of large branchiopods described in this study. On the other hand, there is an urgent need to increase knowledge about their biology, ecology and distribution, so that the knowledge necessary for making legal decisions that allow their conservation under some form of protection [6, 7].

References

- [1] Casas J.J. et al. 2012. Farm ponds as potential complementary habitats to natural wetlands in a Mediterranean region. *Wetlands* 32: 161-174.
- [2] Cérignino R. et al. 2008. Biodiversity and distribution patterns of freshwater invertebrates in farm ponds of a south-western French agricultural landscape. *Hydrobiologia* 597: 43-51.
- [3] Verdiell-Cubedo D. 2012. Inventario y estado de conservación de las charcas ganaderas en la Región de Murcia (SE Península Ibérica). *Anales de Biología* 34: 1-8.
- [4] Ballester R. (coord). 2003. *Humedales y rambas de la Región de Murcia*. Dirección General del Medio Natural. CARM.
- [5] Gascón S. et al. (2012). Spatial characteristics and species niche attributes modulate the response by aquatic passive dispersers to habitat degradation. *Marine and Freshwater Research* 63: 232-245.
- [6] García de Lomas, J. y otros autores (2015). Orden Anostraca. *Revista IDE@ - SEA*, 67: 1-12.
- [7] García de Lomas, J. y otros autores (2015). Orden Notostraca. *Revista IDE@ - SEA*, 71: 1-10.