Conclusions

1. Two protocols differing in sorting procedures have been presented and compared, obtaining similar results. When samples are sorted in the lab, a subsample of 200 individuals is enough to obtain almost all families and a reliable biological index rank. However, depending on the objectives to achieve it should be considered the application of each protocol.

2. The field protocol developed in Spain can be applied satisfactorily in other mediterranean areas in the world, obtaining family richness, macroinvertebrate composition and biological quality values similar as the obtained in methods developed especially for those areas.

3. Convergences and divergences in the macroinvertebrate structure between mediterranean regions are related to historical and local factors. Mediterranean regions in northern hemisphere areas are highly convergent in macroinvertebrate structure, whereas southern hemisphere is divergent between them and with the northern ones.

4. Responses to temporality are less convergent between regions than habitat, indicating that the last is a more important constraining filter than temporality.

5. Temporality modifies habitat characteristics changing the riffle-pools sequences of rivers. A gradient of sites and community composition is found between riffles, connected pools and isolated pools. Similar richness is found between the three macrohabitats, what jointly with the high specific community in isolated pools, suggest that isolated pools act as islands but not to refuges to riffles communities. Pools connected to riffles are an intermediate habitat between riffles and isolated pools.

6. Habitat and temporality are interconnected. Temporality changes habitat characteristics, and habitat induces temporality. Different levels of spatial and temporal heterogeneities are observed between permanent, intermittent and ephemeral reaches affecting macroinvertebrates. In all cases, differences in macroinvertebrates are found between wet and dry season. In the application of the idea from "River Habitat Template", mediterranean rivers present different biological traits depending on the reach condition: permanent, intermittent and ephemeral.

7. A total of 91 Trichoptera species in Iberian Mediterranean have been identified, extending the distribution areas of some of them and confirming the presence of some others. Relevant taxonomic and ecological information is presented. Along the Mediterranean coast and increase of the proportion of North African and endemic species is noticed through the south. European distribution species are dominant in all cases.

8. Distribution patterns observed in caddisfly along Iberian Mediterranean coast are heterogeneous in space and time. The factors implied are mixes of environmental variables acting at different scales from basins to habitat characteristics, being longitudinal river zonation and geology the most important. The highest richness was collected in Segura basin, with a mix of northern and southern species, what can be related to historical factors.

9. Optimums and tolerances of caddisflies at family and species level are presented for different variables related to pollution. These variables affect differently to each caddisfly taxon. Ecological profiles patterns from families and species are similar for some taxa but not for others, depending on the number of species and the intolerance degree of family. An index to measure the degree of intolerance is presented to be used as a biological index of caddisflies.

10. Larvae of *Hydropsyche exocellata* present an increase of fluctuating asymmetry downstream for all measured traits, what it has been related to pollution levels. Salinity, suspended solids and phosphates are strongly related to asymmetry, but its importance it is different depending on each morphological trait.


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