

“*Liverworts of the Mediterranean*”: Helene Bischler’s research and passion

Helene Bischler’s last book, “*Liverworts of the Mediterranean – Ecology, diversity and distribution*” is a great achievement. This synthesis will not only benefit people interested in bryophytes or, more generally, in evolutionary ecology of the Mediterranean flora, but it also represents a comprehensive example of advanced multivariate statistics applied to a large dataset of collections aiming at inference of ecology and evolution. Through her work, Helene Bischler not only addresses the scientific community working on the taxonomy and ecology of bryophytes, but also scientists and students beyond this community.

The conception of the research presented here illustrates Helene Bischler’s credo. She decided to revisit an enormous database, containing information that Dr. S. Jovet-Ast and she herself had accumulated through fieldwork between 1966 and 1982, and used modern statistical tools to address fundamental questions in evolutionary ecology. The dataset includes 11342 samples, representing 151 taxa collected in 2852 plots in 17 areas around the Mediterranean, i.e. nearly half of the taxa recorded from these areas. Each site is characterized by 20 environmental variables and each sample is described based on 13 life history traits. Some of the data had previously been published, others are original. The originality of the work lies in the synthesis of the whole dataset. During her research, Helene Bischler has always looked for, and has applied, new concepts, methods or techniques to increase knowledge on the organisms that she studied. Here, she used statistical methods that had been developed and made available much after the dataset had been produced.

The materials and methods are described in detail and by their quality may serve as an example for students: what is essential in the dataset and during the computing phase, which choices have been made, what should be further discussed. The first goal was to identify ecological groups of the species, the environmental variables determining these groups and their geographical distribution. Multivariate analysis of species’ distributions with environmental variables was carried out. Eight ecological groups of species were defined. One of the interesting conclusions is that these liverworts communities do not perfectly coincide with phanerogamic communities*. A second line of investigation was the analysis of patterns of life history traits through multiple correspondence analysis. One interesting conclusion is that life history patterns seem to be more related to co-ancestry than to environmental constraints. A third direction of the work was the description of diversity, both at population level (genetic diversity) and community level. We learn that liverworts in the Mediterranean do not have a high genetic diversity, neither within nor among populations. This contrasts with the patterns found in phanerogams and raises the question of their different evolutionary history in the Mediterranean. The latter question is addressed in a separate section. The last (and longest) part of the publication, invaluable for Mediterranean ecologists, provides distribution maps and detailed information

* I subjectively selected a few conclusions just to illustrate the multiple fields of interest covered in this synthesis. There are of course many more interesting results!

(ecological tolerance, preferences and limiting factors in terms of climate, vegetation and habitat) for each of the 151 liverwort taxa recorded in the Mediterranean.

By achieving this synthesis Helene Bischler has undoubtedly succeeded in transmitting her passion. She wrote in introduction: "*It is hoped that this account of the ecology, diversity and distribution of Mediterranean liverworts, as seen from our samples, will stimulate further investigation*"; this was her credo and, certainly, we cannot imagine a better stimulation.

François Lefèvre
Directeur de Recherches
INRA, Unité de Recherches Forestières Méditerranéennes, Avignon