

Mercantour-Alpi Maritime Generalised Biological Inventory: An Example of Successful Collaboration between Protected Areas Managers and Taxonomist

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Abstract

This article aims to highlight the strong collaboration built between protected areas managers and taxonomists, in the framework of the Mercantour/Alpi Marittime Generalised Biological Inventory.

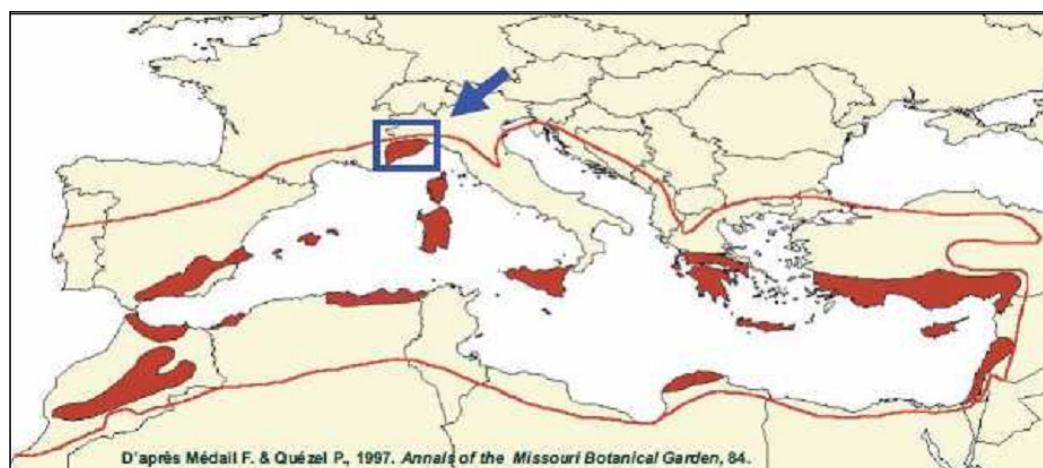
Keywords

ATBI, Generalised Biological Inventory, Inventory, Biodiversity, Taxonomy, Protected Areas, National Park, Natural Park, Mercantour, Alpi Marittime.

Introduction

Since 2007, the Mercantour National Park (MNP) and the Alpi Marittime Natural Park (AMNP) have been endeavouring to enhance their knowledge of their natural heritage through the first exhaustive inventory of the biodiversity on their territories : the Mercantour-Alpi Marittime Generalised Biological Inventory (formerly ATBI+M: Mercantour-Alpi Marittime All Taxa Biodiversity Inventory+Monitoring) (DE BIAGGI et al.2010).

Due to its geographical location, varied geology and altitudinal gradient, our territory includes great diversity of habitat. It is thus home to an exceptionally high number of species and is considered to be a biodiversity hotspot on a planetary scale (MÉDAIL & QUÉZEL 1997). The scientific community therefore finds it extremely attractive.



However, a substantial part of its biodiversity remains to be discovered and listed, notably in groups that are less studied such as insects, bryophytes and lichens, etc...

It is to this end that our two parks decided to implement a joint Generalised Biological Inventory, the first inventory on such a large scale in Europe and the second one in the world.

The National Natural History Museum of Paris has been striving to improve knowledge of the Mercantour - Alpi Marittime territory since 2001, harnessing the parks expertise to carry out inventories of spiders and molluscs in the MNP. When the European Distributed Institute of Taxonomy (network of excellence in taxonomy) was created in 2006, and offered to help set up exhaustive biodiversity inventories (then called ATBI+M (All Taxa Biodiversity

Inventory + Monitoring)), the National Natural History Museum backed parks' application to become the site for the first European ATBI+M.

Thanks to this scientific guarantor, and to the reputation of our structures and our territories, our application was accepted. From as early as December 2006, we could therefore rely on the scientific community linked to EDIT (i.e. a network of over 250 taxonomists from all over Europe), with the network growing as the project advanced, notably thanks to non-professional taxonomists who joined in along the way, and the involvement of local networks of naturalists. Today, almost 350 taxonomists work hand in hand with us to take our inventory forward.

Methods

We decided to concentrate on the least known taxa (i.e. invertebrates and non-vascular flora), but without neglecting other better studied taxa (such as herpetofauna, mammals and vascular flora). Many prospection campaigns were carried out in the least investigated natural environments (cavities, hyporheic zones, etc).

Prospection campaigns take place between May and October, weather permitting, and take two forms:

- Either the scientists come individually and decide themselves where they will prospect, heeding recommendations from the parks. They are only authorised to collect taxa they can identify or must provide us with the list of the taxa they wish to collect and of the competent individuals to whom they wish to send them. The travel and accommodation costs of these researchers are reimbursed.
- Or scientists come in teams. In this case, prospection sites are co-determined with the parks for a programme lasting from 2 to 4 years. These prospection campaigns frequently involve a high number of taxa, with the specimens shared out among the team. These scientists benefit from an agreement with the parks covering their travel and accommodation expenses plus certain other costs related to the inventory (collection equipment, sample sorting, etc).

Research carried out by the teams is relatively easier to monitor and organise than individual research, although the two types of prospection are complementary.



Setting up an interception trap (photo: Elise Minssieux)

Results

After the specimens have been collected, the identification phase can take from a few weeks to several months, depending on taxonomic group and the quantity of material collected. We then ask each researcher (or team of researchers) to provide us with a list of species collected (which is then entered into the National Natural Heritage Inventory (INPN) (<http://inpn.mnhn.fr>)) plus a report commenting on the list (What extrapolations can be made based on the species collected? Which are rare species? Endemic species? etc).

Currently, 61.000 data concerning more than 10.000 species have been integrated in the INPN; all these data are shared with the MNP and AMNP managers, but the imprecise data are also available for consultation by the public (communal scale).

Collected specimens are kept by the collectors, apart from one specimen per species that is sent to the National Natural History Museum if collected in France, or to the Regional Natural Sciences Museum in Turin if collected in Italy.

Our project also incorporates the option of carrying out molecular studies (barcoding) on collected taxa, to find out more about their systematics and/or phylogeny. These studies are carried out either by the Molecular Systematics Department at the National Natural History Museum, or by the CBGP (Centre for Biology and Management of Populations). Over 2,000 sequences of the gene CO1, concerning at least 434 species, have already been published. This work is already starting to bear fruit, advancing taxonomy (species divided into a species complex, etc).

Discussion

As we expected, no major discoveries have been made in the field of vertebrae. Apart from better knowledge about its spread, vascular flora did not bring any huge surprises either, apart from one species that is new to France (*Moehringia argenteria*). On the other hand, however, the inventory has considerably increased our knowledge of the invertebrate world: in six years of prospection, the number of listed species in our parks has tripled, and many families have not yet even had the opportunity to be prospected! Another example is lichens. The inventory of lichens in several valleys of the MNP produced a list of 1,277 species of lichen compared to 426 before the inventory. 16 are new species for science, 1 new for Europe, and 53 are new for metropolitan France. Similarly, in the AMNP, 193 species were listed. This represents an increase of almost 60% in the number of species known for that zone. Our knowledge about bryophytes (taxonomic group including mosses and non-vascular plants) has been considerably enriched, too. 183 species have been listed, including 39 that are rare and interesting from a conservation point of view, plus 7 that have never been seen before in the Piemonte region.

Most of the discoveries pertained to the arthropod group. Several hundred species were observed for the first time in the two parks; dozens are new fauna for France and Italy, and approximately thirty are waiting to be described (i.e. new for science). As an example, we can mention the description of the coleopter sub-species *Duvalius magdelainei tordjmani*, harvested in 2010 in a cavity in the Roya Valley by the Terrestrial Biospeleology Group. At the Parco Naturale Alpi Marittime, a species of troglobite arachnid that lives exclusively in caves and is new for science has been described under the name *Troglocheles lanai*.

Conclusion

In the long run, this inventory will enable us not only to learn more about our natural heritage, but also to understand better how our ecosystems function. We are currently setting up a number of monitoring projects to help assess the impact of human activities on our territory, so that it can be managed optimally. The impact of climate change will also be studied when monitoring the spread of certain alpine species.

The Generalised Biological Inventory did not focus exclusively on the scientific and technical aspects of the survey of biodiversity in the Marittime-Mercantour sector. It also addressed the fields of education, science teaching and communication in an effort to heighten the awareness of a broad audience about environmental dynamics and the role man and his activities play. Taxonomy Summer Schools were organised for students and academics, and educational activities and naturalist excursions for schoolchildren. Finally, photo exhibitions entitled "Taxon" and "Inventaires sans Frontières" (Inventories without Borders) were organised jointly with the museums in Turin (Regional Natural Sciences Museum) and Paris (National Natural History Museum), exposing this inventory project and, more generally, taxonomy and its role in understanding biodiversity, to large numbers of people.

Our initiative has encouraged other European protected areas to start their own Generalised Biological Inventory: Muranska Planina National Park (Slovakia) in 2008, and Spreewald Biosphere Reserve (Germany) in 2010.

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