http://biodivmex.imbe.fr/

CALL FOR CONTRIBUTIONS

BIODIVMEX PROSPECTIVE WORKSHOP

29 Sept. - 2 Oct. 2015

Venue:

Observatoire de Haute Provence (http://www.obs-hp.fr/welcome.shtml)
04870 Saint Michel l'Observatoire

The workshop languages will be either English or French

BIODIVMEX, OBJECTIVES AND ACTIVITIES

BIODIVMEX is one of the programmes of MISTRALS, an interdisciplinary CNRS meta-program which aims at implementing systematic observations and research on the Mediterranean environment. BIODIVMEX addresses issues about biodiversity of the Mediterranean region, its specificities and vulnerability to recent changes in socio-economic and physical drivers. BIODIVMEX also aims at creating a network of researchers to impulse and promote interdisciplinary research in the Mediterranean region including north-south collaborations.

The main activities of BIODIVMEX are: i) to facilitate the development of innovative interdisciplinary research projects built upon the BIODIVMEX network; joint responses to major calls for projects are envisaged; ii) to organize workshops and thematic schools to exchange and disseminate knowledge; iii) to support young scientists; iii) to develop joint publications (books, special issues, or policy or public oriented reports) and financially support some publications; iv) to make linkages with global level programs for environment and, v) to support key scientists or students that develop innovative works, to participate at conferences or other scientific events.

OBJECTIVES OF THE WORKSHOP

The general objective of the workshop is to develop our understanding of long-term processes, natural and anthropogenic, that have shaped the Mediterranean biodiversity. We also intend to evaluate current changes and/or vulnerability status of Mediterranean biodiversity on the basis of our present knowledge in ecological and/or social sciences.

The first objective of this workshop is to discuss key topics related to two main themes which have been identified during previous BIODIVMEX activities, in order to improve our understanding of Mediterranean biodiversity evolutionary dynamics and functioning, as well as identify and promote work in key research areas. Both scientific themes cover, terrestrial, marine as well as fresh water environments, and may be approached by biological/ecological and social sciences separately or jointly.

The second objective of this workshop is to create a network of researchers involved in the Mediterranean region. We hope to collectively establish a roadmap to develop activities (research projects, training courses, collaborative publications, etc.) under our main themes for the coming four years with the help of piloting committees (per work package) involving scientists that represent social and biological/ ecological sciences as well as the two themes, to be established at the end of the workshop. Preliminary topics have been identified (see below “Tentative work packages”) as a support for exchanges during the workshop and starting point for discussion. The workshop will comprise series of oral presentations as well as work in small groups.

A master paper or a series of papers in a special issue is envisaged.

MAJOR THEMES

are:

THEME 1: Biodiversity of poorly known and highly constrained environments by abiotic factors and biotic interactions.

THEME 2: Biodiversity within socio-ecological system (SES)

TENTATIVE WORKPACKAGES

N.B. ***All WP cover the two above themes or in other words, contributions may cover either of the two above themes within a WP. These WP remain totally open to innovative ideas and discussions. We aim at improving the list of WP proposed here as well as possible contents.***

WP 1: Insularity. Keywords: social and biological settings, isolation, economy, biological and climatic specificities, extinction-colonization processes

WP 2: **Fragmentation and connectivity**. Keywords: natural or human-induced effects, complex mosaics,, ancient or new terrestrial and marine landscapes under current changes, conservation, metapopulations, metacommunities.

WP 3: Habitats and biodiversity values. Keywords: remarkable, structuring, endemic, widespread, rare, protected, values for conservation, people or ecosystem services, regression, evaluation, vulnerability.

WP 4: **Ecotone or transitional environments.** Keywords: coastal lagoon, coastal terrestrial and sea areas, forest- agriculture, sea-shore habitats, urban peripheries, cliffs, road and path sides.

WP 5: Historical construction of landscapes along a natural to a highly anthropogenic gradient Keywords: habitats, agroecosystems and agrodiversity, ancient and recent human practices, domestication.

Organization

Main Organizers: Virginie Baldy (UMR 7263 Institut Méditerranéen de Biodiversité et d'Ecologie marine et continentale, IMBE) and Yildiz Thomas (UMR 5175 Centre d'Ecologie Fonctionnelle et Evolutive), Co-directors of BIODIVMEX, MISTRALS, CNRS.

Scientific Committee of Biodivmex: Bertrand Schatz (UMR CEFE), Vanina Pasqualini (Univ. de Corse), Thierry Perez (UMR IMBE), Thierry Tatoni (UMR IMBE), Samuel Robert (UMR ESPACE), Laurent Bouby (UMR ISEM), Chantal Aspe (UMR LPED), Wolfgang Cramer (UMR IMBE).
Contact Addresses: Virginie Baldy: virginie.baldy@imbe.fr and Yildiz Thomas: yildiz.thomas@cefe.cnrs.fr

You are invited to send a short presentation of your contribution of about 1000 words to both contact addresses. These short presentations should state in what WP you intend to be associated to, and should give a clear statement of scientific questions, results and perspectives linked to the context of this workshop. Deadline for submission: 20st July 2015.
Cost of stay (board and lodging) will be arranged for residential participants, free of cost. Biodivmex will also cover the travel costs, if they do not exceed 200 € for travel within France and 500 € for travel from abroad for a total of 50 participants.

For more details see below and the web site

FURTHER DETAILS and INFORMATION

Specificities of Mediterranean biodiversity

At the global level, it is increasingly recognised that biodiversity needs to be considered not as a separate entity from humans, the latter being for most societies an integral element of biodiversity, ecosystems and nature as a whole. In Europe the Nature-Culture dichotomy emerged only during the classical periods (XVIIth century) with the emergence of Cartesian thinking. The Mediterranean region which is the cradle of European civilization is a unique opportunity to understand the dynamic interactions between living beings, including humans, with one another and effects of these interactions on environment. The importance and level of ancient human's interactions with biodiversity and the fact that the region remains one of the world's hotspot of biodiversity is seen as a paradox. But is it a paradox or simply the result of long-term co-existence within contexts of interactions that have transformed progressively within specific socio-political contexts? We wish to identify the complex interactions that ensue from interactions between humans (including, world views, organizations and governance systems) and other living beings and their biological and ecological dynamics. To what extent these interactions have influenced the exceptional biodiversity of the Mediterranean region as well as human development.

The Mediterranean region is characterized by an exceptionally high biological diversity of plants, animals and other taxa. This situation may be attributed to paleo-climatic and bio-physical contexts, as well as effects of anthropogenic and agricultural practices since the Neolithic. This region is one of the 34 biodiversity hot spots at the global level. In this area equal to 2% of the Earth's surface, there are 20% of the flowering plants and ferns of the world. It is home of one of the most important center of origin of agriculture and plant and animal domestication, the Fertile Crescent, at the origin of many of the most valuable crops and animals of the modern world (wheats, barley, peas, sheep, goat, cow and pig). Ten regional Mediterranean biodiversity hotspots have been identified and they contain 5,500 endemic plants, mainly located on islands and mountains. In France, the area with a Mediterranean bio-climate only represents 11% of the national territory but it is home to about three-quarters of higher plants and between 55 and 90% of the country's vertebrate species. Although precise figures are not available for terrestrial invertebrates, exceptionally high diversity is known for many groups, especially for arthropods, for which a high level of endemism in the Mediterranean zone is well known. The marine environment is very rich and contains 12 to 15,000 species. Thus only 0.8% of the surface of the global ocean contains 4 to 18% of the world biodiversity according to some taxonomic groups. Its fauna and flora comprise approximately 20-30% of endemic species. The Mediterranean biodiversity and marine ecological diversity are concentrated in shallow environments which represent only 5% of the surface of the Mediterranean Sea, located in coastal areas, most subject to pressure from human activity as well as to climate change.
Historical paleoecological contexts,present climatic constraints (dry summer season) and diversity of habitats linked to diversity of relief and substrates, as well as very diversified disturbances linked to human activities, have probably contributed to considerable evolutionary advantages. The high proportion of endemic species illustrates long lasting evolutionary history and contemporaneous speciation. Moreover, we observe in this region species that are widely distributed and which structure terrestrial communities (e.g. oak and pine forests, *garrigue*, old chestnut or olive-agro-ecosystems) or marine environments, (e.g. *Posidonia* beds or coralligenous bio-concretion). Some of the structuring species or popular or emblematic taxa such as lavender and olive trees are peculiar to the Mediterranean environment and are of high patrimonial value. Agrodiversity, especially intraspecific diversity of Mediterranean domesticated species including cereals and fruit trees as well as adventitious plants, have evolved over almost 10 000 years. They are also of major patrimonial value and are threatened by agricultural industrialization and rural depopulation. All of these contribute to collective environmental and societal identity of the Mediterranean region. Some may

be rare when they are located at the margin of their geographic area or in historical isolates. The convergence of a remarkable biodiversity associated with long term human pressures is what has termed as the "**Mediterranean paradox**" (BIODIVMEX 2014). However, increasing and rapid changes have led the region to be considered as an ecoregion under a situation of crisis and major threats regarding the conservation status of its biodiversity Loss of large amounts of widespread or rare species may also threaten environmental /ecosystemic services. Around 300 million humans currently live around the Mediterranean basin. Water shortages, desertification, rural exodus associated to dismantlement of social organizations and abandon of rural and highly complex food web systems, are among the most serious problems for human societies. Industrialization and specialization of agriculture, artificialization and fragmentation of habitats with urbanization and industries, increased marine exchanges are probably the most serious threats to the persistence of biodiversity, in addition to climate change. Numerous endemic species may be confined to very particular spaces or specialized habitats and are therefore extremely vulnerable to habitat loss, urban expansion and over-grazing or fishing pressure in a large part of the Mediterranean basin. Understanding the effects of global change including climate and societal changes and monitoring changes is therefore of high priority..

BIODIVMEX THEMES: scientific background and questions raised

THEME 1: Biodiversity of poorly known environments, highly constrained by abiotic factors and biotic interactions.

The Mediterranean region has a diversity of environments where exceptional biodiversity have not yet been fully identified. These environments are generally characterized by extreme abiotic and biotic constraints besides being isolates. These are for example, sub-marine or terrestrial caves, cliffs, forests and other ecosystems (grasslands, screes) of high altitude, but also specialized habitats in the southern arid fringe. These areas are of little accessibility and therefore have suffered less or very low anthropogenic pressure, although global factors of anthropogenic origin may now become new threats.

Researches should focus on:

- Baselines: biodiversity: taxonomy, assessment

- Evolutionary processes responsible of the high speciation and endemism in these constrained ecosystems; the relative importance of rare vs structuring species is a key point for future ecosystems management and conservation.

- Adaptation of species to these extreme environments. What types of species structure these terrestrial or marine communities? Which life traits? Which functioning (sexual vs clonal reproduction), including ecophysiological adaptations (for example primary vs secondary metabolism) related to water stress and other constraints? Understanding adaptations and convergence of morphology, traits, biotic interactions (e.g. xerophytes of high altitude, juniper on cliffs, marine sponges, plants on screes) and adaptive trade-offs contributing to niche-separation and coexistence such as the water use efficiency – relative growth rate trade-off, are major avenues for future research.

- Functioning of these particular ecosystems. Understanding the role of abiotic and biotic (interactions such as competition, facilitation) factors in shaping these environments and related communities need to be better understood. These environments can be structured by geomorphological context but also a few numbers of species living in extreme conditions; this raises the question of the role of this biodiversity on ecosystem functioning and inversely how physical contexts affects biodiversity?

-Vulnerability or resilience of these ecosystems to recent impacts related to diverse human activities (e.g. tourism) or global changes and particularly climatic changes needs to be understood.

BIODIVMEX will promote research to improve our knowledge of this rare, sometimes hidden, biodiversity which is potentially very fragile, and which hazards are most important for actual and future risks of extinctions.

THEME 2: Biodiversity within socio-ecological system (SES)

Mediterranean socio-ecological systems (SES) are terrestrial, humid or marine environments that result from long term interactions between human activities and environments and which have shaped, or hosted specific biodiversity. For instance, these interactions are linked to the use of fire, mining, cultivations practices, pastoral activities, building terraces, ponds, managing water inputs in coastal lagoons etc.

SES are for instance agro-ecosystems, forests, meadows, ponds, fish farms, shellfish ponds, coastal lagoons, human infrastructure such as walls, terraces, harbours, etc. Many of these traditional SES are threatened by various and little studied factors of change rural exodus, industrialization and have been abandoned giving way to new cohorts of biodiversity in the context of successive stages, including introduction of non-indigenous species. While people overexploited some parts of biodiversity, other parts have been shaped by anthropogenic activities. The nature of human actions are changing implying diverse and complex new spatio-temporal interactions with biodiversity, including increase in the rapidity of changes as well as the geographic scale affected.

New forms of interactions are related to factors including agricultural industrialization, globalization of food systems and food policies, long distance commercial and human exchanges, including maritime as well as terrestrial genetic resources exchanges, urbanization, mining, and global factors such as invasive species, climate change etc. Some of the “traditional” SES are still present, mainly in south Mediterranean countries but are shrinking very rapidly. New SES, with heavier effects related to human interactions, are being created such as urban waste grounds, mine dumps areas or highly polluted sea offshores, but also recreational areas such as gardens and extended roof systems in urbanized areas. They also host specific biodiversity that requires to be better understood. Connections which were ensured by man-made elements, in ancient SES, are now fragmented due to abandonment or on the opposite, mosaics maintained by humans for centuries are now becoming excessively homogeneous due to natural afforestation for example.

Social groups, with their local identity, are often linked to SES and different revival movements to keep them alive are ongoing, putting forward for example the importance of local products attached to geographic indications, local know-how and collective identity. For example chestnut trees are

among the oldest standing trees in the Mediterranean region although they have been pruned and transformed. As individual trees and through forming large populations, they host a large diversity of insects, lichens, small mammals and birds some of which are endemic and very rare.

Some of these environments (e.g. Mediterranean ponds) originally created by humans for domestic animals, are the habitat of rare and endangered species. These anthropogenic ecosystems can now be considered as "extreme" or "rare" environments (link with the Theme 1).

Some of the questions that arise within this theme are:

What specific biodiversity has developed with biocultural interactions in the Mediterranean region, on the basis of what human practices, what are the functional and evolutionary traits of concerned plants, animal, fungus and other microorganisms? What part of regional diversity is hosted by SES? What are the dynamic features of on-going changes in SES, both from social and biological perspectives? What biodiversity counts and for whom? Do SES host only widespread species? What are their contributions to ecosystem services?

BIODIVMEX will promote future research on SES, and will focus on understanding human-environment interactions at different spatio-temporal scales, including past and present processes, rather than focusing on threats.