

COLLECTION OF MEDICINAL PLANTS

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50 000 TO 70 000 PLANTS SPECIES ARE CURRENTLY USED FOR TRADITIONAL OR MODERN MEDICINE, and many are still studied for their potential medicinal properties (UNEP 2002 ; Juffe-Bignoli *et al.* 2012). Plants have been used for millennia for medical purposes, with evidence of their handling going back as far as 60 000 BCE (Gurib-Fakim 2006 ; Petrovska 2012). According to the World Health Organisation, nowadays 80% of emerging countries' populations depend on traditional medicine, which is mainly based on plant remedies, for their primary health care needs. Medicinal use of plants is gaining more and more interest with the rising costs of medication and the growing interest for a more nature-based lifestyle (Akerle *et al.* 1992). Plants can be used directly through one or several parts, or as a model for synthesised components in western countries.

In the Mediterranean basin, no less than 25 000 plant species can be found, more than half being endemic (Myers 2000 ; UNEP 2002). Northern Africa has one of the richest, oldest and most diverse use of medicinal plants in the region, many of them with a non-negligible socio-economic value (UNEP 2006). The semi-arid environment of this region is also compatible with the cultivation of many of them, though the majority are gathered from the wild (Cunningham 1993 ; Carrubba *et al.* 2002).



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THREATS TO THE PRACTICE

Though essential for many people, some medicinal plants are facing extinction threats. They are often grouped with aromatic plants and more generally within “Non Wood Food Products” (NWFP) such as mushrooms or nuts, which are facing the same challenges against extinction (Mutke *et al.* 2019). One of the main threat medicinal plants are facing is overexploitation, but habitat loss and degradation is also important, due to land use intensification and climate change (Akerlele *et al.* 1992; Cunningham 1993; Vié *et al.* 2009; Rhazi *et al.* 2010). This is also emphasised by the belief that plant resources are endless (WHO 1993), and the rising need from high demand sectors (Brenko *et al.* 2018). As a result, at least 1 in 5 utilised freshwater plants in Northern Africa is threatened with extinction. Similarly, around 100 species of the European Red List of Vascular Plants are known having medical properties and more generally at the global scale around 15 000 medical and aromatic species are threatened to some degree (Schippmann *et al.* 2006; IUCN 2012; Juffe-Bignoli *et al.* 2012). Moreover, the majority of medicinal plants are collected in the wild, and the lack of regulation and control are allowing the black market system to thrive (Mutke *et al.* 2019). Cultivation may be a solution to counteract overharvesting, but it can also lead to environmental degradation, loss of genetic diversity and a decrease in the interest for their conservation in the wild (Schippmann *et al.* 2006).

Despite their essential role for many people, these plants suffered from a conservation gap, primarily due to a lack of public knowledge (IUCN 2012). Information concerning medical properties of plants are often transmitted among local people, rarely recorded or easily accessible (WHO 1993). As such, potentially threatened plants may not benefit from conservation efforts. Moreover, not many are kept in genebanks, unlike crops or more economically profitable seeds (Akerlele *et al.* 1992).



Cultivation of thyme (*Thymus satureioides*) in High Atlas, Morocco © Inanc Tekguç GDF

RECOGNITION AND FUNDING

Medicinal plants are still widely used in many parts of the world, and are the target of an increasing demand from western countries, with the desire of a more ecological lifestyle or cheaper remedies than those used in modern medicine. In the last 50 years, several programmes were set up to gather information and take conservation measures targeting these species. In 1978, the WHO launched a study to overcome the knowledge gap in this domain, leading to the identification of 20 000 species of medicinal plants (Levingston & Zamora 1983). In order to partly fill the knowledge gap IUCN and WWF launched a consultation in 1988 on the priorities and recommendations for conservation of medicinal plants. They created the Plant Conservation Programme which targets plants of economic value, with a priority put on medicinal and aromatic species (WHO 1993). The Medicinal Plant Specialist Group founded in 2004 by the IUCN is also an important actor to raise awareness on the threats regarding these plants and the importance of their conservation (Leaman 2020).

Medicinal plants, along with aromatic species and NWFP, benefit as well from a growing recognition concerning their socio-economical value. The Innovation Networks for Cork, Resins & Edibles (INCREDIBLE) created in 2017, aims to facilitate the sharing of information and to help developing local actors equitable business with social and environmental sustainable practices. Aromatic and medicinal plants are priority themes to focus their actions (Brenko *et al.* 2018 ; Mutke *et al.* 2019). Large scale development of plant-based drugs may however be difficult, since pharmaceutical industries of western countries can as well find it more economically advantageous to discover or synthesise new drugs rather than focusing on traditional remedies.



Aromatic plant collection, Lebanon © Shouf Biosphere Reserve

1. CULTURAL SUSTAINABLE LAND-USE PRACTICES

80% of the populations in some pilot sites are relying on plants for their health. They are used to treat various medical conditions on all parts of the body, from the skin to the nervous or respiratory system and several parts of the same plant can have different actions (Moroccan Biodiversity and Livelihoods Association & Global Diversity Foundation, 2020).

90% of medicinal and aromatic plants are collected in the wild leading to the depletion of wild populations. Overcollection is not the only, or even in some case the major threat on these species, but it can provide an argument to establish conservation measures to allow both the protection of species, and new incomes for local populations (Cunningham, 1993 ; Juffe-Bignoli *et al.*, 2012).

However, with the development and construction of more roads linking rural communities to cities, conventional medicine is more easily accessible. This led to a decrease in plant-based medicine use, especially in the younger generations (Moroccan Biodiversity and Livelihoods Association & Global Diversity Foundation, 2020).

RESEARCH BY THE ALLIANCE FOR MEDITERRANEAN NATURE AND CULTURE (AMNC)

A report from the Moroccan Biodiversity and Livelihoods Association and the Global Diversity Foundation (2020) interviewed High Atlas local communities to gather information on plants, allowing to identify 119 local plant species as having medicinal or veterinary status. It is essential to collect and record this traditional knowledge that is slowly disappearing, and interviews and inventories are the best way to achieve this (Senouci *et al.*, 2019).

2. BENEFITS OF THE PRACTICE

2.1. BIODIVERSITY

Though some medicinal plants are threatened, those which are more commonly used are managed and protected by the local populations through land-use practices, water management, etc. Local and traditional knowledge can then enhance biodiversity through development of other practices.

Wild populations can be protected from overcollection through cultivation (Schipmann *et al.*, 2006), but sustainable harvest is still the most important conservation strategy, especially when cultivation is not conceivable. Moreover, most of the time non-lethal harvesting is enough, since it is often only a part of the plant that is needed. More research is still necessary however on sustainable harvest rates, practices, and policies (Juffe-Bignoli *et al.*, 2012).

2.2. CULTURAL

The traditional collection and use of medicinal plants is still the main or only access to healthcare for rural communities. Through ethnobotany, documenting the knowledge of local communities about traditional medicines is critical, with significant potential benefits of keeping local names and indigenous uses of plants (Senouci *et al.*, 2019). The importance of this knowledge can be highlighted as well by the fact that 74% of 121 biologically active plant derived compounds used worldwide have been discovered through research based on ethnological uses of the plants (Farnsworth *et al.*, 1985). It is also important to know the local population's view on which plants are in need of protection, which can be different from the IUCN opinion. While the latter are targeting endemic and/or rare species, local communities would put more values on plants for their practical use.

Moreover, some of these plants are cultural keystones, with medicinal, gastronomic, symbolic or spiritual value. It is also a practice involving both men and women, which can help reduce the gender gap in some countries (Moroccan Biodiversity and Livelihoods Association & Global Diversity Foundation, 2020).



Lion's foot (*Leontice leontopetalum*), Greece
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Za'atar, a spice mix composed of aromatic herbs and spices from Lebanon © Shouf Biosphere Reserve

2.3. CLIMATE CHANGE

There is still a need to assess the vulnerability of medicinal plants to climate change (IUCN, 2012), but some of its consequences such as increased frequency of droughts or floods have an impact on habitat degradation which can in turn affect plant species (Akerlele *et al.*, 1992).

2.4. SOCIO-ECONOMICAL

With the growing interest in high demand sectors in western countries, there are increasing opportunities to invest in these plants to supply them (UNEP 2006). Their commercialization can offer important livelihood opportunities, and several projects aim to actively involve collectors, growers and other local workers for medicinal and aromatic plant cultivation, with sustainable practices aimed at conservation (Mutke *et al.* 2019). In the Imegdjal region of High Atlas, out of the 211 reported used plant taxa, more than half of them are commercialised, and farmers are encouraged to increase their production (Moroccan Biodiversity and Livelihoods Association & Global Diversity Foundation 2020). Small-scale cultivation through home gardens is a solution to both avoid wild population decline, and bring additional income to the family (Agelet *et al.*, 2000).



Sustainable harvesting of medicinal and edible plants, Lebanon © Jamal Hamzeh SPNL

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