

# Conservation and sustainable use of wild edible plants in the Eastern Mediterranean region

by Jemma TAYLOR, Lina SARKIS, Nizar HANI,  
Khaled ABULAILA & Tiziana ULIAN

***Wild edible plants play a key role in the nutrition and development of populations in the eastern Mediterranean. In 2010, UNESCO recognised it as an intangible cultural heritage of humanity. The collaboration between the Royal Botanic Gardens, Kew in the UK, the National Agricultural Research Center in Jordan, and the Lebanese Agricultural Research Institute in Lebanon under the Millennium Seed Bank (MSB) partnership has enabled hundreds of seed collections. The Shouf Biosphere Reserve in Lebanon has joined the partnership and opened the door to the restoration of traditional farming practices and the marketing of products from key species useful to local communities.***

The Millennium Seed Bank Partnership (MSBP or MSB), formerly known as the Millennium Seed Bank Project, is an international conservation initiative led by the Royal Botanic Gardens, Kew, with the purpose to provide an “insurance policy” against the extinction of plants in the wild by collecting, curating and conserving seeds for future use.

The project commenced in 1996 and is housed in the Wellcome Trust Millennium Building (Figure 1) situated in the grounds of Wakehurst Place, West Sussex, in the UK, where more than 40,000 species from around the world, which means over 2.3 billion seeds, are conserved long-term (Figure 2).

Jordan and Lebanon are part of this partnership and the National Agricultural Research Center (NARC, <http://www.narc.gov.jo>) in Jordan and the Lebanese Agricultural Research Institute (LARI, <http://www.lari.gov.lb/>) in Lebanon have been collaborating with RBG Kew since early 2000 under an ‘Access and Benefit Sharing Agreement (ABSA)’. The Shouf Biosphere Reserve (<http://shoufcedar.org/>) has been contributing to this project in Lebanon by supporting the seed collection, study and *ex situ* conservation of Lebanese flora in the Shouf Biosphere Reserve (SBR).

The MSBP with Jordan and Lebanon has aimed at conserving the flora in each country by collecting and conserving seeds for many important and indigenous plant species (Figure 3). So far, it has



**Figure 1:**

The Wellcome Trust  
Millennium Building,  
Wakehurst Place,  
in the U.K.

Photo credit:  
W. Stuppy, RBG, Kew

secured and conserved 636 species from Jordan and 924 species from Lebanon, about 8% of which are wild edible plants (Figure 4). As the partnerships mature, we are now focusing specifically on the conservation of wild edible species used in the traditional diets of the local people in the Mediterranean climate parts of both countries.

The Mediterranean diet has been considered a healthy and sustainable diet for a long time (BURLINGAME & DERNINI, 2011) and in 2010, was recognised by UNESCO as an important cultural heritage of humanity (<https://ich.unesco.org/en/decisions/5.COM/6.41>). It is characterized by fresh fruit and vegetables, olive oil, some dairy and fish, with low amounts of meat and low to moderate amounts of wine (WILLETT *et al.*, 1995). In many of the Mediterranean countries, wild edible plants are part of the fresh fruit and vegetable intake, when they are available in season. However, many of these are traditionally sourced and used and wild

plants are under threat mainly by habitat destruction and climate change (AL-EISAWI, 2012). On the other hand, knowledge is being lost with the elderly people and it is not being passed on to the next generations (ALI-SHTAYEH *et al.*, 2008, JEAMBEY *et al.*, 2009). This is a detriment to these countries, both culturally and from a health perspective as many of these traditional plants are highly nutritious (CECCANTI *et al.*, 2018).

In the Eastern Mediterranean region, countries such as Jordan and Lebanon have a range of wild edible species which complement their diet and have been favourites for generations (JEAMBEY *et al.*, 2009). They are often only available for a short time and are collected from the wild in large enough quantities for sale at markets. This is especially true of *Gundelia tournefortii*, which is known as 'Akkoub' locally (KAPLAN *et al.*, 1995) (Figures 5 and 6). A collecting trip to Jordan in April 2019 involved researchers from MSB, SBR and NARC and focussed on collecting plant tissue particularly of the edible parts of key Mediterranean plants both from sites where the plants grow wild, but also from markets, where they had already been collected and are being sold to the consumer (Figure 7). These will be used to explore some of the chemical and nutritional traits of the plants but also to understand the genetics of the plants to support future breeding efforts.

In collaboration with partners in Jordan, NARC and Lebanon, SBR the aim of the project is to promote the sustainable use of the traditional Eastern Mediterranean diet by preserving the traditional knowledge and utilising science-based conservation and cultivation of wild edible plants. This will be done by collecting and preserving ethnobotanical knowledge held by people living in the Eastern Mediterranean and collecting seeds for wild edible plants to aid in their conservation. A range of research techniques will be undertaken to understand more about the biology, and nutritional quality of the wild edible species. This process will support conservation, explore sustainable use options and their value as plant products. In addition, a database collating information about Mediterranean wild edible and medicinal plant species will be constructed. This will help inform decisions around which species are of most interest and their location to further collections of plants important to the Mediterranean diet.

**Figure 2:**

Inside the vault  
of the Millennium Seed  
Bank in the U.K

Photo credit: RBG, Kew.





This project links to activities carried out by the Shouf Biosphere Reserve related to the sustainable harvesting of edible wild plants, in addition to their production with other local crop varieties on the agriculture terraces.

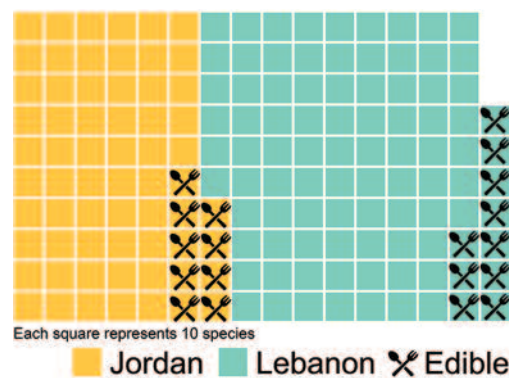
The traditional cultivation on terraces allows the selection of a highly diversified number of local crop varieties, and the dry stone walls play an important role in terms of biodiversity conservation as micro-habitats for plants, insects, reptiles, amphibian, birds and mammals. In this context, pilot demonstration actions have been implemented, with the collaboration of private owners, on the restoration of multifunctional stone wall terraces on the western slopes of Mount Lebanon. Sustainable marketing strategies for local products from plants harvested in the wild or produced in the terraces, with a high economic value and strong territorial identity, are being developed in collaboration with local communities, with a main focus on women and youth. Training sessions are being organized for local stakeholders on all the stages of the value chain, from organic production to processing, marketing and business development, and the economic potential of the tourism-linked values of the restored stone terraces.

The tourism sector, whether traditional or eco-tourism, has become part of the cycle, where service providers such as *tables d'hôtes*, guest houses, restaurants and hotels have been encouraged to purchase their products such as Sumac from the local farmers. Moreover, a farmer's market known as Souk el Ghalle is already in place in Baqaata, an urban agglomeration in the Shouf, allowing people to directly purchase the products. Two other markets are also being developed, one in the large village of Barouk, near a very popular entrance to the Reserve, and one in a coastal town considered to be the gateway to the region.

The partnership between Kew, SBR and NARC has permitted the conservation of important Mediterranean plants in Jordan and Lebanon. Having laid these foundations, the collaboration is continuing with a more ambitious aim: to preserve traditional knowledge of wild edible species and their cultivation to improve food security, support livelihoods and maintain biodiversity in the Eastern Mediterranean region.



**Figure 3:** Dr Khaled Abulaila, Director of Plant Biodiversity and Genetic Resources at the National Agricultural Research Center (NARC) while collecting plant material for conservation.  
Photo credit: NARC



**Figure 4:** The number of wild edible species as a proportion of all species conserved at the Millennium Seed Bank from Jordan and Lebanon.  
Pablo Gomez Barreiro (RBG, Kew)



**Figure 5:** *Gundelia tournefortii* growing in the wild.

**Figure 6:** *Gundelia tournefortii* inflorescences being sold at a local market in Jordan.  
Photo credit: Pablo Gomez Barreiro (RBG, Kew).





## References

- AL-EISAWI, D. 2012. Conservation of natural ecosystems in Jordan. *Pakistan Journal of Botany*, 44, 95-99.
- ALI-SHTAYEH, M. S., JAMOUS, R. M., AL-SHAFIE, J. H., ELGHARABAH, W. A., KHER-



**Figure 7:**

Nijad Saed Eddine (SBR) and Heba Mohammad Ahmad Almenwer (NARC) collecting *G. tournefortii* for research in Jordan.

Photo credit: Pablo Gomez Barreiro (RBG, Kew)

**Figure 8:**

Agricultural terrace in the Shouf Biosphere Reserve which has been restored.

Photo Credit: SBR, Lebanon

- FAN, F. A., QARARIAH, K. H., ISRA'S, K., SOOS, I. M., MUSLEH, A. A. & ISA, B. A. 2008. Traditional knowledge of wild edible plants used in Palestine (Northern West Bank): a comparative study. *Journal of Ethnobiology and Ethnomedicine*, 4, 13.
- BURLINGAME, B. & DERNINI, S. 2011. Sustainable diets: the Mediterranean diet as an example. *Public health nutrition*, 14, 2285-2287.
- CECCANTI, C., LANDI, M., BENVENUTI, S., PARDOSSI, A. & GUIDI, L. 2018. Mediterranean Wild Edible Plants: Weeds or "New functional crops"? *Molecules*, 23.
- JEAMBEY, Z., JOHNS, T., TALHOUK, S. & BATAL, M. 2009. Perceived health and medicinal properties of six species of wild edible plants in north-east Lebanon. *Public health nutrition*, 12, 1902-1911.
- KAPLAN, D., PEVZNER, D., GALILEE, M. & GUTMAN, M. 1995. Traditional selective harvesting effects on occurrence and reproductive growth of *Gundelia tournefortii* in Israel grasslands. *Israel Journal of Plant Sciences*, 43, 163-166.
- WILLETT, W. C., SACKS, F., TRICHOPOULOU, A., DRESCHER, G., FERRO-LUZZI, A., HELSING, E. & TRICHOPOULOS, D. 1995. Mediterranean diet pyramid: A cultural model for healthy eating. *American Journal of Clinical Nutrition*, 61, 1402S-1406S.

Jemma TAYLOR

Tiziana ULIAN \*

Royal Botanic Gardens, Kew,  
Wellcome Trust Millennium Building,  
Wakehurst Place, Ardingly  
West Sussex, RH17 6TN, UK

\* Corresponding author: t.ulian@kew.org

Lina SARKIS

Nizar HANI

The Shouf Biosphere Reserve, Park House,  
Main Square, Maasser el Shouf, Shouf,  
LEBANON

Khaled ABULAILA

National Agricultural Research Center. PO Box  
639, Baqa'a, 19381, JORDAN

## Summary

The Mediterranean diet consists of fresh fruit and vegetables, olive oil, and low in meat and dairy, and is associated with health benefits. In 2010, UNESCO recognised it as an intangible cultural heritage of humanity. In Jordan and Lebanon, the traditional Eastern Mediterranean diet includes wild-collected edible species. The collaboration between the Royal Botanic Gardens, Kew in the UK; the National Agricultural Research Center in Jordan; and the Lebanese Agricultural Research Institute in Lebanon, under the Millennium Seed Bank (MSB) partnership has enabled hundreds of seed collections to be made of the flora in both Jordan and Lebanon over the last 20 years which have been stored in country and at Kew's MSB. This has been an important work to ensure the conservation of the native flora in the Eastern Mediterranean region. More recently, the Shouf Biosphere Reserve (SBR) in Lebanon has joined the partnership and has enabled the focus to shift towards the conservation of wild edible species and support the restoration of traditional cultivation practises, such as terracing, within the SBR, and in producing marketable products from some of the key species to enhance the livelihoods of the local communities. We are now looking to expand our work to encompass further conservation efforts as well as research into the nutritional quality and seed biology of several key wild edible species.