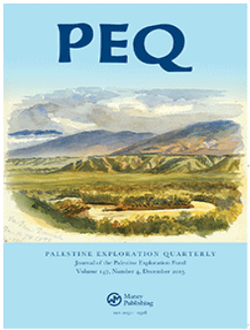

Palestine Exploration Quarterly

ISSN: (Print) (Online) Journal homepage: https://www.tandfonline.com/loi/ypeq20

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To cite this article: Emily Mourad Hanna, Katrine Gro Friborg & Mazin B. Qumsiyeh (2021): Temporal change in traditional knowledge and use of wild plants in Artas, Palestine, Palestine Exploration Quarterly, DOI: 10.1080/00310328.2021.1975069

To link to this article: https://doi.org/10.1080/00310328.2021.1975069

Published online: 16 Sep 2021.

PALESTINE EXPLORATION QUARTERLY
https://doi.org/10.1080/00310328.2021.1975069

Routledge
Taylor & Francis Group

Temporal change in traditional knowledge and use of wild plants in Artas, Palestine

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ABSTRACT

Traditional communities have wide knowledge and experience of wild plants as natural resources that have historically been important for food, medicine, spiritual and hygienic uses. These communities have over generations developed knowledge, skills, beliefs and practices related to the natural environment that they are a part of. This type of knowledge is defined as Traditional Ecological Knowledge and is critical in the understanding of cultural heritage. Palestine encompasses a unique cultural heritage regarding wild plant use. The village of Artas, south of Bethlehem, has been researched by ethnobotanists and anthropologists as early as the 1930s, where studies illustrate the profound rooted connection Palestinian villagers held with their natural surroundings, and how social coherence around the outdoor life was entrenched in the local culture. The results of this study indicate that foraging wild plants was traditionally a social activity, and the villagers attach a lot of meaning to these plants due to their medicinal and nutritional value, but also as a part of their surrounding environment around which their lives revolved. The Israeli occupation since 1967 progressively caused a shift from a century-old common-pool resource to a restricted area, which eliminated the access to ancestral land and will possibly diminish future levels of Traditional Ecological Knowledge.

KEYWORDS

Palestine cultural heritage; Traditional Ecological Knowledge; wild plants; West Bank; ethno-botany; UNESCO

Introduction

Local traditional communities have a wide knowledge and experience of wild plants as natural resources that have historically been important for food, medicine, and other uses such as spiritual and hygienic applications. These communities have over generations developed specific knowledge, skills, beliefs and practices related to the natural environment they are a part of, which is handed down through generations by cultural transmission (Martin 1995; Berkes et al. 2000). This type of knowledge is defined as Traditional Ecological Knowledge (TEK) (Berkes et al. 2000) and is critical in the understanding of cultural heritage (Parrotta 2007) and traditional management of resources (Berkes et al. 2000). TEK is defined as the 'cumulative body of knowledge, practice and belief, evolving by adaptive processes about the relation of living beings with one another and with their environment' (Berkes et al. 2000). Local knowledge is embedded

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in everyday life and emerges from the local ecological context (Antweiler 1998), and evolves continuously, adding the lessons from the past to the present (Bonny and Berkes 2008).

According to UNESCO, knowledge, skills, practices, representations and expressions concerning nature and the universe are part of a community's and/or group's intangible cultural heritage. UNESCO's Convention for the Safeguarding of the Intangible Cultural Heritage states that

> intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity (UNESCO 2003).

Given these definitions, skills and practices concerning nature are closely related to TEK, which in turn then forms an important aspect of a group's intangible cultural heritage.

Today TEK is being eroded on the global level because of increasingly consumerist societies and modern agriculture (Abdallah & Swaileh 2011; Koohafkan and Altieri 2011), urbanisation, and resultant environmental degradation and erosion of traditional life (Ali-Shtayeh et al. 2008; ARIJ 2016). To circumvent cultural knowledge loss, it is imperative to assess the knowledge pool, the spatial and social distribution of knowledge, the source of acquisition and the social transmission of knowledge (Antweiler 1998). In some places the loss is happening even before native community knowledge is documented or archived.

In Palestine, the work of the Palestine Exploration Fund in the 19th century was pivotal for areas like agriculture, geography, geology, botany, and zoology sparking great interest in this part of the Fertile Crescent (the cradle of civilizations). Remarkable work by three researchers (Grace Mary Crowfoot, Hilma Granqvist, and Louise Baldensperger) in marginalized villages in Palestine in the early part of the 20th century was inspired by the PEF (see for examples Crowfoot 1943, 1951, 1952; Crowfoot and Baldensperger 1932; Weir 1975; Naili 2008, 2013). It was thus of interest to us at the Palestine Museum of Natural History (palestinenature.org) to carry out a new study on the current status of traditional knowledge and use of wild plants in Palestine.

Traditional knowledge of wild plants in Palestine

Palestine, also known as the Occupied Palestinian Territories since Israel annexed the West Bank and the Gaza Strip in the 1967 war, is currently ruled by the Palestinian Authority in the West Bank and by Hamas in the Gaza Strip. Israel's occupation of the West Bank and Gaza supports internationally recognised illegal settlements in the occupied West Bank, where Palestinian land is expropriated and access to basic services is restricted, making it nearly impossible for Palestinians to build in much of the West Bank without risking demolition. Israel's closure of Gaza since 2007 severely restricts the movement of people and goods there, with devastating humanitarian impact (Human Rights Watch 2020). Palestine includes a rich, complex cultural heritage because of its location and history; a crossroad of continents, a part of the Fertile Crescent where humans first domesticated plants and animals, and bedrock of religions and civilizations (Qumsiyeh 2017). Palestine encompasses a unique cultural heritage regarding

wild plant use (Hadjichambis et al. 2007), with hundreds of endangered and several endemic species (Ali-Shtayeh et al. 1998; Al sheikh and Salman 2000; Applied Research Institute 2007). The West Bank is home to approximately 700 wild edible and medicinal plant species (Silva and Abraham 1981; Shtayeh and Hamad 1995); many of which have been used in folkloric medicine (Palevitch and Yaniv 1991). The tradition of gathering wild medicinal and edible plants kept alive for centuries is now declining (Alhirsh et al. 2016; Ali-Shtayeh et al. 2008).

A marginalised village in the West Bank is Artas (from the Latin name *Hortus Conclusus* the enclosed garden/paradise), south of Bethlehem. It is the most studied Palestinian community in terms of cultural heritage and its ethnographic studies passed through stages of European studies under Ottoman rule, then local Palestinians in the late 19th and early 20th century such as Stephan Hanna Stephan (1922, 1942) and Tawfic Canaan (1928, 1936, 1962), then serious anthropological studies in the first half of the 20th century (Baldensperger 1913; Granqvist & Seger, 1981; Crowfoot & Baldensperger, 1932; Crowfoot 1943, 1951, 1952) followed by a period of neglect likely due to the conflict that transformed much of Palestine into the State of Israel in 1948. There is recent interest in reviving ethnographic studies of Artas (Nazer et al. 2010; Naili 2009, 2013) and other areas of Palestine, but these remain sparse (Qumsiyeh 2017; Simaan 2017).

In order to have an understanding of the extent of usage and knowledge of wild plants in Artas almost a century ago, and how nature formed an important part of Palestinian culture, a literature review of an ethnobotanical study from the middle of the twentieth century has been conducted. The study by Crowfoot & Baldensperger (1932) illustrates the profoundly rooted connection Palestinian villagers from Artas held with their natural surroundings and how social coherence around the outdoor life was entrenched in the local culture. Furthermore, the study elucidates how numerous plant species were narrated through songs, folk tales, and connected with legends and myths. Crowfoot & Baldensperger (1932) describe the extend of traditional knowledge in numerous portrayals e.g., when newcomers to the area would watch the village women in the fields, supposing that they were weeding meticulously, however, to their surprise they would see how carefully the bunches of 'weeds' were subsequently carried back to the village. Here the whole family would participate in the sorting of the treasures found in the fields. It is also described how knowledge was transmitted between generations, when a mother in the spring would give her child a bit of bread and say, 'There, go and find yourself something to eat with it' (1932, 37), and the child would return with leaves and ask if they were edible or not (Crowfoot & Baldensperger 1932).

In times of famine, war and scarcity, the villagers were able to support life for a time when their crops failed, hence, wild plants of the valley served as a focal safety net. Beside gathering plants for subsistence, wild plants were sold in the markets in Bethlehem and Jerusalem (Crowfoot & Baldensperger 1932) and formed an important part of the villagers' livelihood. Vernacular names were given to plants by the use that defined the species or the attitude towards the plant, e.g., *Murrar*–'the bitter one' (*Centaurea pallescens* Delile). Plants that were disliked or non-edible were generally given disapproving names like 'of the snake' *ya haya* or 'of the donkey' *ya homár*. These include *Kseksa el haya*—Snake's Kseksa (*Vicia palaestina* Boiss.) and the poisonous *Bandoret el Haya*—

Serpent's tomatoes (*Solanum americanum* Mill.) or *Khass el homár*—Donkey's lettuce (*Lactuca serriola* L.) a despised plant in Artas (Crowfoot & Baldensperger 1932).

Many plants are mentioned in Palestinian folklore, as the Kirsene (*Vicia ervilia* L.) whose round seeds were often thrown on the doorstep at weddings and were said to cause evil spirits to trip up and go away. Another mentioned is the Squill (*Drimia maritimia* L. Stearn), the different timing of the flowering of the Squill is believed to be either a good or bad omen for the coming crop season. Za'tar known by every Palestinian (*Origanum Maru*, L.) is also essential in the folklore referred to as plant that clears the brain and also has the reputation, 'Who for forty days eats powdered or dried leaves of Za'tar fasting can be harmed by no serpent' (Crowfoot & Baldensperger 1932).

The influence of plants in religion and myths, the appreciation of the beauty of trees, herbs, and flowers, and relationship with nature is also explained by Canaan (1928) as extensive and deeply embedded in the Palestinian culture. The belief that the natural world encompassed supernatural powers, as local saints—the *awlia*—lived and appeared in plants, was common (Canaan 1928). Given the historical importance of wild plants to Palestinian culture, the aim of this article is to analyse the meaning traditional ecological knowledge holds for villagers in Artas today as part of their cultural heritage, the perceived loss of this traditional knowledge, and the main political, ecological and societal threats currently posed to maintaining it.

Methodology

The study was conducted in the village Artas, situated 2.4 km southwest of Bethlehem (31°41'23.34"N 35°11'17.68"E). The climate is Mediterranean with dry summers and rainy mild winters, with a mean annual rainfall of 500 mm and temperatures ranging from 6–35 °C. The total population of Artas in 2017 was 5695 (PCBS 2018). The main economic activity has traditionally been agriculture. Artas is considered the food basket of the Bethlehem area due to its extensive farming activities in the valley. Today agriculture is still one of the main economic activities (50% of the labour force), followed by the Israeli labour market (19%) (ARIJ, 2010). Artas is traditionally a village of olive groves 'the blessed tree', here, farmers and villagers have traditionally used trees, herbs, pulses and grains in a wide array of domains, including for medicine, food sustenance and nutrition, religious, magical and/or spiritual reasons (Crowfoot & Baldensperger 1932).

In this study, we reviewed the literature relating to knowledge and usage of wild plants both historically and present day and worked closely with villagers and the Artas Folklore Center to understand the past and current situation regarding the knowledge and usage of wild plants in this Palestinian village and how the erosion of this knowledge is perceived. Fourteen semi-structured interviews were carried out with members of the Artas community to obtain in-depth knowledge and perceptions about the wild plants they forage, their usage, knowledge transmission, and the threats and challenges they face when they forage. Interviewees were aged between 45 and 90 years old, with a mean age of 68. They were identified with the help of the Artas Folklore Center who have a wide social network in the village. The criteria for interviewing these individuals were that they were known in the village for having prior knowledge and experience of wild plants. The interviews were sound recorded, transcribed and translated. Prior

approval by all interviewees to use the information provided for a research article was obtained.

Direct observation was undertaken during the interviews, including observation of the home gardens and fields of the villagers where interviewees identified the types of plants available in their surroundings. Observation of the distribution of agriculture and the locations of Israeli settlements in relation to the village was also carried out. The 'free listing' method was used to measure the level of plant knowledge (Ryan et al. 2000), the data was then categorized according to local plant names, Latin names, and main usage.

Results

The contemporary knowledge and usage of wild plants

Artas villagers harvested wild plants 90 years ago and still do today although to a lesser extent.

Today, the villagers in Artas speak of the foraging of wild plants in a fond manner, reminiscing 'the good days' when they would go to the mountains with their families to forage wild plants, both as children and as adults: 'Today life is not like it was in the old days, we were poorer but happy'. In this study the interviewees mentioned 41 different edible and medicinal species from 23 plant families. The plants most commonly mentioned were: Khubeze (*Malvasylvestris* L.) (Figure 1a), Louf (*Arum palaestinum* Boiss) (Figure 1b), Luffete (*Hirschfeldia incana* (L.) Lagr. Foss), Za'tar (*Origanum syriacum* L.) closely followed by Qre'a (*Matricaria aurea* (Loefl.) Sch. Bip. 'Ilek (*Cichorium pumilum* L.), Ja'deh (*Teucrium polium* L.), Lisan ilthor (*Salvia hierosolymitana* Boiss), and Maramiyeh (*Salvia fruticosa* Mill). These plants were used for food and for

Figure 1. (a on the left) Khubeze *Malva pusilla*; (b on the right) Louf *Arum palaestinum*.

medical purposes, including for indigestion (*Salvia fruticosa*) and to fight symptoms of the common cold or flu (*Teucrium polium* and *Matricaria aurea*). Louf, (*Arum palaestinum*) an edible plant, was mentioned although most interviewees explained that this plant is not widely consumed in Artas or the South of the West Bank, but rather in the North. As it is a poisonous plant, it needs to be prepared in a specific way by soaking and boiling the leaves several times before being safely consumed. In the northern West Bank, it is cooked by stuffing dough with the prepared leaves to make salty pastries. The leaves of Lisan ilthor are prepared in a similar way as vine leaves, that are rolled and stuffed with rice and meat. Khubeze and Luffete are both fried with onions, sprinkled with lemon, and eaten as a simple main dish, or a side dish. Za'tar is the most famous and well-known herb used in Palestine, it was used in baked bread and most commonly ground with sesame seeds, as a kind of powder that bread is dipped in with olive oil. Maramiyeh, Qre'a and Ja'deh are medicinal plants that are boiled and then consumed either through inhaling the steam or as an herbal tea.

All interviewees speak of the medicinal benefits of consuming wild plants, and the nutritional value of these plants compared to processed food that is—unfortunately in their eyes—mostly consumed today: 'Cold cuts and all these things people eat today are not good for you; sausage and cold cuts that you can buy in the stores today are not healthy, better to give it to the dogs!' In this way wild plants have a double advantage from their perspective, in that the ones that can be consumed for food are both tasty and nutritious. In addition to these medicinal plants, many examples were given of plants that were used for curing various illnesses, mainly the common cold, stomach aches and indigestion, but also infertility, rheumatism and illnesses related to the nervous system. The description the interviewees gave of these plants and their uses, especially the medicinal plants, were always expressed in a manner of awe, implying the perfection of God's creation ('*Subhan Allah*'), implying that every plant in nature has a purpose which humans can benefit from, thanks to a sacred force. When asked how they feel about natural water sources and wild plants providing in times of need, the interviewees expressed that they were grateful to God for these blessings that come out of the wilderness 'like miracles'. This expressed awe is similar to the value that nature holds among other local and indigenous people across the world who see themselves as guardians or stewards of nature (Posey 2002) and echoes back to the descriptions of the importance of plants to Palestinian culture and spirituality in the Crowfoot & Baldensperger study from 1932.

Perception on the loss of traditional knowledge

Most interviewees lamented the loss of knowledge of wild plants among the younger generation and wished for them to revive such knowledge. According to them, traditionally children would accompany their parents or grandparents to forage specific wild plants that were in season or to graze the animals and would find various kinds of plants to snack on during their outing.

The way the knowledge has been transmitted is usually through vertical knowledge transmission, meaning that the interviewees' parents, and later in-laws, were the ones who taught them which herbs can be foraged, and for what purposes.

The interviewees spoke in a manner of regret and hopelessness about the younger generation today as they are not interested in these local wild plants, and that they don't

understand their value: 'My children and grandchildren do not care about these things'. They perceive the younger generation as looking down upon wild plants used for food, as something that reflects poverty or the traditional ways. They do not consider it a real meal: 'The younger generation doesn't appreciate the nutrition of these herbs, they find it primitive; cooked herbs and greens are looked down upon as if it's not a real meal, even though it has a lot of health benefits'.

They explain that the reason the younger generation does not make use of these plants for medicinal purposes is that they would rather go to a medical doctor and pay money to buy medicine from the pharmacy, when according to them many of their ailments can be cured by wild plants: 'The new generation does not know about these herbs. Today they go to the doctors instead; the women don't use these herbs as we did before, they would rather get the pharmaceutical medicines'.

At the same time, certain efforts are made by the villagers to transfer this knowledge to their daughters or their sons' wives, especially regarding medicinal herbs. Three of the interviewees explained that they often advised them on herbs that could be used to cure various illnesses, especially for their grandchildren. One of them stated that she insisted on feeding her children dishes made of wild plants, because it is such an important part of Palestinian heritage. The way they explained the reduced usage of wild plants for medicinal purposes is that in their youth, there were no medical doctors and therefore people would make use of the nature that surrounded them, by testing different herbs and plants to cure various ailments. They reasoned that this may be why this knowledge has remained with the older population but is not as common among the younger generations who have better access to medical healthcare.

Discussion

While many studies in Palestine suffered from orientalist attitudes of explorers (Qumsiyeh and Saeed 2018), we found occasional detailed studies such as those of Crowfoot and Baldensperger (1932) to be remarkably accurate and useful. But it was also useful to compare knowledge temporally to document loss of knowledge. Such reanalysis of older texts was shown before to be highly useful (e.g., Goupil and Qumsiyeh 2018; Saeed and Qumsiyeh 2020). When the interviewees listed the types of wild plants that they know and used to forage, several plant varieties listed in the study by Crowfoot and Baldensperger (1932) were mentioned (Table 1). However, the plants they mentioned were mainly medicinal and for food sustenance purposes. Plants used for hygiene, spiritual/religious uses or construction were nearly not mentioned at all, with the exception of one interviewee who mentioned a plant used for making broomsticks 'kudhab' (*Ephedra major* Host) and another who spoke of a plant 'zuheif' (*Thymbra capitata* (L.) Cav.) that she used for washing milk containers.

When interviewees were asked about the spiritual, religious or other folk usage of wild plants they said they did not know about it and suggested that we interview older villagers in order to get this kind of information. This is in stark contrast to the extended list of usage of wild plants for purposes other than food and medicine, mentioned by Crowfoot and Baldensperger (1932), cultural and religious uses such as at wedding ceremonies, during childbirth, or as objects of magical properties. This indicates a potentially significant loss of knowledge and usage of wild plants for these purposes in the last 90 years,

Table 1. Plants mentioned in interviews. Abbreviations for use: L Leaf, Fl Flower, Fr Fruit, St Stem, R Root.

Latin name	English name	Arabic name	Family	Medicinal	Edible	Hygiene	Timber	Species mentioned in Crowfoot & Baldensperger (1932) as edible or medicinal
Anchusa strigose Banks & Sol.	Prickly alkanet	Hemhem	Boraginaceae	L				Medicinal use
Anemone coronaria L.	Anemone	Hannun	Ranunculaceae	Fl				Mentioned as a beautiful flower
Arum Palaestinum Boiss	Elephant's Ear	Louf	Araceae		L			Leaves Poisonous
Capparis spinosa L.	Capers	Khubar	Capparaceae	St, Fr	Fr			Not mentioned
Centaurea iberica Sennen & Elias	Pale star thistle	Murraar	Compositae		L			Edible leaves
Chiliadenus iphionoides (Boiss. & Blanche) Brullo	Sharp varthemia	Shteileh	Compositae	L		Fl, L		Not mentioned
Cichorium pumilum Jacq.	Wild chicory	´Ilek / hindbeh	Compositae	Fl	L			Edible leaves
Crataegus azarolus var. aronia L.	Hawthorn	Alzaerur / Zaerur	Rosaceae	L, R	Fr			Medicinal use
Cupressus sempervirens L.	Cypress	Alsaro	Cuppressaceae	Fr, L				Not mentioned
Cyclamen persicum Mill.	Cyclamen	Suzu	Primulaceaee		L			Not mentioned
Cynodon dactylon (L.) Pers.	Bermuda grass	Ngiel	Poaceae	St, Fl, L				Not mentioned
Dittrichia graveolens (L.) Greuter	Stinkwort	Inola	Compositae	L				Not mentioned
Ephedra sp.	Ephedra	Kudhab	Ephedraceae	St		St		Not mentioned
Gundelia tournefortii L.	Tumble thistle	Akoub	Compositae		Fl			Flowers edible
Hirschfeldia incana (L.) Lagr.Foss	Short pod mustard	Lufette	Brassicaceae		L			Leaves edible
Lotus tetragonolobus L.	Asparagus-pea	Jelathon	Leguminosae		Se			Edible seeds
Lycium europaeum L.	Arabian boxthorn	'Iswej / 'Awsaj	Solanaceae	R, L	Fr			Not mentioned
Malva sylvestris L.	Common mallow	Khubeze	Malvaceae		L			Edible leaves
Mandragora officinarum Mill.	Mandrake root	Tufah il majaneen	Solanaceae		L			Edible leaves
Matricaria aurea (Loefl.) Sch.Bip.	Chamomile	Babounej/ Qre'a	Compositae	Fl				Medicinal use,
Mentha spicata L.	Mint	Na'na'	Lamiaceae	L	L			Not mentioned
Morus nigra L.	Black mulberry	Tout	Moraceae		Fr	L		Not mentioned
Origanum syriacum L.	Bible hyssop / Syrian oregano	Za'tar	Lamiaceae	L	L			Edible leaves
Paronychia argentea Lam	Silver Nailroot	Ijer ilhamameh / Regl Alhamameh	Caryophyllaceae	L	L			Not mentioned
Phagnalon rupestre (L.)DC.	African fleabane	Soufan	Compositae			Fl, L, St	St, L	Tinder plant
Pimpinella anisum L.	Anis	Yansoon	Apicaceae	Se				Not mentioned
Portulaca oleracea L.	Common purslane	Baqleh; Irjele	Portulaceae	L	L			Leaves edible, Seeds used for medicine
Quercus coccifera L.	Oak	Ballout	Fagaceae	L, R				Sacred tree
Rhamnus lycioides L.	Palestine buckthorn	Sweed	Rhamnaceae	L, Fr				Not mentioned

Rosmarinus officinalis L.	Rosemary	Klil ilghar	Lamiaceae		L	Not mentioned
Rumex vesicarius L.	Ruby dock / sorrel	Hummeid	Polygonaceae		L	Edible leaves
Salvia fruticosa Mill.	Sage	Maramiyeh	Lamiaceae	L		Leaves Medicinal
Salvia hierosolymitana Boiss	Bull's tongue	Lisan iltor	Lamiaceae		L	Edible leaves
Sarcopoterium spinosum (L.) Spach	Thorny burnet	Natesh	Rosaeceae	R		Not mentioned
Silybum marianum (L.) Gaertn	Milk thistle	Khurfesh	Compositae		L	Edible leaves
Sinapis sp.	Mustard	Alkhardal (khardal)	Brassicaceae		L, Se	Not mentioned
Sisymbrium irio. L.	Hedge mustard	Hwere	Brassicaceae		L	Edible leaves
Teucrium creticum L.	Rosemary Germander	Kamandara	Lamiaceae	L, St, Fl		Medicinal use
Teucrium polium L.	Poly Germander	Jádeh	Lamiaceae	L, St, Fl		Medicinal use
Thymbra capitate (L.)Cav.	Mediterranean thyme	Zuheif/ Za'tar Farsi	Lamiaceae	L	L	Medicinal use
Urtica dioica L.	Stingy Nettle	Kurreis	Urticaceae	L	L	Not mentioned

which has a negative effect on the preservation of Palestinian intangible cultural heritage that this traditional ecological knowledge is part of.

Traditional knowledge related to wild plants forms an important part of Palestinian culture and history. According to the interviews, the way of life of the villagers revolved around wild plants and agriculture, where harvesting in season was a social activity that involved the whole family, and where particular plants were used for various purposes, from food to medicine (that are often interlinked) and cultural ceremonies and events (Crowfoot and Baldensperger 1932) which are an important aspect of the intangible cultural heritage so positively expressed by the interviewees in their descriptions. The perceived loss of traditional knowledge is explained as part of modernisation and disinterest by the younger generation. Ali-Shtayeh et al. (2008) argued that since the majority of the younger generations are not interested in traditional knowledge, they lack the knowledge required to identify, gather and process valuable plant species. Furthermore, the consumption of wild plants is often associated with a negative symbol of poverty of the past (Ali-Shtayeh et al. 2008). As the rural population often constitute the principal consumers, social stigmas as 'food of the poor' are frequently associated with traditional crops, and thus often present a constraint that affect the adoption or readoption of the consumption (Padulosi et al. 2014; Rudebjer et al. 2011). This is in line with the results of our study in Artas. However, the main contributing factor to this perceived loss of knowledge that all interviewees in this study expressed is the Israeli occupation.

Interviewees stressed that they were severely affected by Israeli land confiscations. In particular, the nearby settlements, illegal under international law, restrict their movements and access to land. 'The mountain tops have all been taken over by the settlers'. They are no longer able to reach part of the surrounding mountains and valleys of Artas, where they used to collect wild plants, as they are denied access. A sentiment of despair was often present when the subject of the Israeli occupation came up: 'There is no more wilderness for the plants to come out of'. Furthermore, the villagers emphasised that it had become dangerous to forage, even in the areas where they were still permitted access. As the Israeli settlers carried weapons and have been known to attack Palestinian villagers, the Artas villagers were afraid of meeting settlers when they foraged in the mountains: 'I am too afraid to wander in the mountains to forage wild plants, because the settlers might attack me'. The lands where villagers used to forage for wild plants are also often part of Israeli nature conservation areas, and many of the plants they used to pick are currently under threat of extinction, such as 'Akoub – *Gundelia tournefortii*. Several interviewees mention that villagers have been arrested, or fined, for picking wild plants that Israel considers under threat of extinction. Many have also had harvested plants confiscated on their way from the village into Jerusalem to sell their produce. The Israeli soldiers claim that these plants are threatened and not allowed to be foraged. Meanwhile through our observation and from the interviews it is understood that the main threat to environmental destruction in the lands where wild plants usually grow, is the construction of Israeli settlements.

One interviewee mentioned how the natural water spring had been cut off after the nearby settlement was constructed. The valley used to be flooded in the winter months, which attracted migratory birds and was beneficial for soil and crops. However, the construction of the settlements had resulted in a critical decline in the water flow. The 'apartheid' wall was mentioned as being a significant hindrance in

their everyday life (lack of freedom of movement) including as a limitation to the villagers' opportunities to sell the wild plants. Villagers used to go to Jerusalem to sell the produce, where they would get a higher price compared to the local market in Bethlehem.

To face these challenges, the villagers of Artas appear to keep some of their traditional ecological knowledge alive in their home gardens, within their agricultural fields and in their near surroundings. Here edible and medicinal species have been transplanted from the wild or planted themselves by natural seed dispersal and are consumed by the families, and sometimes sold in the market in Bethlehem. One interviewee, who lives a few hundred metres from the large Israeli settlement of Efrat, mentions that she has done her best to transplant as many of the wild plants as possible in her privately owned lands.

The rising number of borders and settlements has decreased Palestinian mobility and limited individuals to small local spaces (Baylouny 2009), a change that also affects the access to the common-based natural resources and thus the collection of wild plants. The rights of access, withdrawal, management, exclusion and alienation of natural resource use (Ostrom 1990), in the surroundings of Artas are increasingly being controlled by the Israeli occupation. Thus, the common-based concept of wild plant and natural resource use—predisposed to honour social equity among its members, since everyone has a common stake in a shared future (Bollier 2003), is gradually being erased. With force, the Israeli occupation progressively causes the shift from a century-old common-pool resource to a restricted area guarded with fences and military outposts, which eliminates the access to ancestral land and possibly will diminish future levels of traditional ecological knowledge.

As in other areas of armed conflict, where oppressed communities are being denied basic human rights of movement and the right to live safely, protecting cultural heritage is instrumental in protecting local and cultural identity (Assi 2012). As these anthropized geographic areas are characterised by complex political and ecological crises, cultural heritage is focal as it legitimises territorial and intellectual ownership and is a key element in the formation of social identity (Logan 2007).

The results of this study indicate that the inhabitants of Artas appear to be making less use of wild plants for food sustenance, medicine, hygiene or other folk usages than 90 years ago. The contemporary consumption of wild edible plants is more an occasional complement to a diet of cultivated crops and store-bought food. The importance of the knowledge and usage of wild plants for the older generation is clear through the positive expressions relating to the past, where social and cultural life revolved around harvesting and consuming wild plants. The perception among the interviewees is that the younger generation does not have knowledge or interest in wild plants and their usages, which is a threat to the transmission of this TEK and cultural heritage. As the results of the study indicate, the causes of the erosion of TEK appears to be multiple but the main factor is the Israeli occupation, as previous research has found; land confiscation, the expansion of the segregation wall, intensive building of settlements and associated roads and military outposts all contribute to the loss of this knowledge (Abdallah & Swaileh 2011).

TEK is interconnected with intangible cultural heritage, which is vital for a population living under occupation to preserve, as it connects the local population to the vast history and cultural traditions of Palestine, before even the foundation of the Israeli State. This

study has highlighted the extent of the knowledge and usage of wild plants and the perceived loss of this knowledge among the younger generation. Preserving this knowledge through continuous links with the land is fundamental to preserving Palestinian identity, which is why the threats posed to it by the ongoing Israeli occupation are existential in nature. More research on this type of intangible cultural heritage is necessary to raise awareness among the local population—especially the younger generation—to empower them to help protect this valuable heritage and in turn their identity.

Acknowledgement

The authors would like to extend their sincere gratitude to the people of Artas, the Artas Folklore Center and the staff at the Palestinian Museum for Natural History in Bethlehem, especially to Ms Summer Shaheen.

Disclosure statement

No potential conflict of interest was reported by the authors.

Funding

Partial support for our work came from the EU Peace Initiative with a grant from the European Commission (ENI/2019/412-148).

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