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Ethnobotanical survey on medicinal and other useful plants from Milos Island (Kiklades Islands, Greece)

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Abstract. Milos is a volcanic island in Greece, isolated from the mainland since its birth 480.000 years ago. The present study provides information on plant species used for medicinal purposes by indigenous people during 16th to 21st centuries. The aim of the study was to collect, preserve and analyse data on pharmaceutical plants used by Milos' inhabitants, to find new plants used in traditional medicine or new uses of the already known ones and to reveal and explain changes of medicinal plants that were used through 16th to 21st centuries. The research was based on interviews of inhabitants, concerning medicinal plant species used in 20th and 21st centuries, on local, folk literature on pharmaceutical plant species used during 16th and 19th centuries, including an unpublished manuscript. Data on 76 native and cultivated plant taxa belonging to 40 families were collected, 68 of them are used mostly for medicinal or other purposes. The interviews' data were statistically analysed. Three taxa were not matched with any other study regarding the medical indication the inhabitants of Milos use them for. A clear restriction on the use of native plants was observed, and evidence about the influence of refugees on the change of medicinal plants use is pointed out.

Keywords: Ethnobotany, Ethnopharmacology, Traditional medicine, Use report, Traditional knowledge.

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Introduction

Plants were the first pharmaceutical substances to be used by humans. The first recorded plant species is *Origanum vulgare* L. (Lamiaceae), which is reported on the Hittites tablets (1660–1200 BC) (Tepe, 2016). Since ancient times, many plant species have been known as therapeutic throughout the Mediterranean basin. Hippocrates (460–360 BC), the founder of the Scientific Expression of Medicine and Pharmacy of the ancient world, used 253 substances taken from plants, minerals and animals without describing them morphologically. In the 1st century AD Dioskourides makes a detailed description and henceforth he is considered the greatest scholar pharmacist - pharmacologist of Antiquity.

The importance of ethnobotany in conserving and protecting biodiversity worldwide is well established today (Bussmann, 2002). However, in Greece, a country with a particularly rich flora and a very high percentage of endemism, not many ethnobotanical studies have been made, while there is no data at all for the Kiklades Islands. Lawendiadis (1961) refers to the most important medicinal plants used in Greece, while several studies have been made mainly about Crete (Skoula *et al.*, 2009, 2010), N. Greece e.g. Zagori, Epirus (Vokou *et al.*, 1993; Malamas & Marselos, 1992), C. Macedonia (Tsioutsiou *et al.*, 2019), Thessaloniki (Hanlidou *et al.*, 2004; Karousou *et al.*, 2007; Kleftoyanni & Kokkini, 2003), Mt. Pelion (Brussell, 2004) and on Greek islands of N. Aegean area (Axiotis *et al.*, 2018).

Milos has been inhabited since prehistoric times. This fact, combined with the relative isolation of the island and its unique richness of its flora, were the main reasons for choosing it for this study. This knowledge survived to the present day and, part of it is still in use, mostly in small, Greek isolated villages and islands, like Milos. This ethnobotanical study of Milos aims to collect, preserve, and elaborate data on pharmaceutical plants used by its inhabitants, to find new plants used in traditional medicine or new uses of the already known ones and to reveal and explain changes of medicinal plants used through 16th to 21st centuries.

Material and Methods

1. Research area

Milos is the most southwestern island of Kiklades islands, Greece, which covers an area of 150.6 km^2, while the length of its shores is 125 km. It is a volcanic island that emerged from the sea 480,000 years ago

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and it has always been isolated from the mainland. Its geological history makes the island very interesting from an ecological, geological and paleontological point of view. The highest mountain, Prophet Elias, reaches 748 m asl and is located in the SW part of the island.

Its population is 4977 inhabitants, according to the last consensus (2011). Almost all the western part of Milos, that is not inhabited, is protected by Natura2000 Network, is characterized by a variety of habitats and according to Strid (2016) its flora includes 825 native taxa, 35 of which are Greek endemics, a considerable high number considering the small surface of the island. The vegetation is consistent mainly in phrygana, maquis and secondly by cultivations. Nowadays, the island's maquis vegetation is characterized by the presence of *Juniperus phoenicea* L., *Juniperus macrocarpa* Sm. Trees, together with *Quercus coccifera* L., *Phillyrea angustifolia* L., *Pistacia lentiscus* L., *Ceratonia siliqua* L., *Olea europea* subsp. *sylvestris* L. etc., dominate the landscape of the island. The biggest plant species naturally grown is *Cupressus sempervirens* L., which was widespread on the island in the past.

2. Plant material

Plant material was collected at the suggestion of interviewed persons and authors of local literature, concerning traditional medicine. It was identified by the article's authors using references on the Greek Flora (Strid & Tan, 1997; 2002; Strid, 2016). Voucher specimens are deposited at the Herbarium of the Laboratory of Systematic Botany, Agricultural University of Athens (ACA).

3. Ethnobotanical survey

Semi-structured interviews and group discussions were conducted to collect ethnobotanical data on the traditional use of medicinal and other useful plants (informed consent was obtained prior to participating in the research study) during 2018 and 2019. Local, elder people were interviewed, all native to and still residing on the island (12 women, 1 man). Most of the interviewees (9 persons) were over 80 years old (70% of them), while 4 persons (30%) were between 55 and 60 years old.

All of them were asked to give information about plant species they used (themselves or their ancestors) to treat several health problems. They were specifically asked about 47 diseases, the season, whether they collected indigenous plants or cultivated species, the place and the part of the plants they collected, the formulation they prepared out of them and the way of administration (Appendix 1, S1). Appendix 1, 2, S1, S2 also provide the most representative worldwide references on the use of mentioned plants. Furthermore, information regarding plant taxa used in household, cosmetic body care and other purposes (except for food) were collected (Appendix S3, S4).

To complete the list of plants used in the island's traditional medicine, additional sources of important data were gathered. That includes local, folk literature about ailments' treatments from 16th to 19th centuries (Vaos, 1982; Vaos, 1986; Pagonis, 2011; Xidou, 2012) and a precious, unpublished manuscript, Vaos, 1993: "Hygiene of Milos from 16th century till the Ottomans' period," which was kindly made available to us by the author's son (Appendix 2, S2). Most of the references cover the whole range of the historical period studied, except for Vaos (1982) work, which covers the 18th and 19th centuries.

Given the existence of relevant literature on medicinal and other useful plants and to make relevant comparisons, the research focused on those plants and the island inhabitants were not asked about the edible plants.

The lists of native plants are given separately from the cultivated ones and those of the plant taxa mentioned in the interviews and literature to facilitate the comparison and identify changes in their use on the island during centuries.

4. Data analysis

For a better understanding the local importance of the plants' pharmaceutical use, the ethnobotanical data from the interviews were analyzed using: (a) report frequency [R.F. = number of individuals who reported the taxon] to determine the popularity of the plants used, (b) indications number [I.N.] and (c) use value [U.V. = Σ (Ai)/N, where Ai=number of reports of the taxon by each individual] (Tardío & Pardo de Santayana, 2008) to determine each taxon's usefulness. Additionally, the Ethnobotany Index (EI), which represents the percentage of medicinal plants used in relation to the total of the plants that constitute the native flora of the area, is determined.

In order to trace changes in the phytotherapeutic approaches by Milos' inhabitants (16th to 21st centuries period) and to conclude whether the Cretan refugees, who arrived on the island after 1830 AD, influenced these changes, data of this study were compared to data from research study entitled: "Non material cultural heritage and biodiversity: Ethnobiological study of Kissamos area, Crete" (Skoula *et al.*, 2010).

Results and Discussion

1. Ethnobotanical survey

The present study is focused on collecting data concerning the pharmaceutical use of native and cultivated plants of Milos used by its inhabitants. The results of the survey are presented in Appendix 1, S1. Plants are arranged in alphabetical order by their scientific name. For each species the plant family, voucher number, local common names, ailment, plant parts used, elaboration-administration, report frequency, indications number, use value and uses reported from the literature are given. Respectively, plants referred

at Milos' folk literature from 16th to 19th centuries are presented in Appendix 2, S2, were scientific name, plant family, voucher number, local common names, ailment, plant parts used, elaboration-administration, indication number and reported uses from previous references are given. Additionally, plants reported in uses other than pharmaceutical are given in Appendix S3, S4.

In total, information on 76 native and cultivated taxa are collected from interviews and local folk literature (45 and 47, respectively), which belong to 40 families and are/were used mostly as pharmaceuticals (66 plant taxa) (Figure S1 and Appendix 1, 2, S1-S4). From a total of 825 native taxa comprising the island's flora, 40 taxa are used for pharmaceutical purposes. Therefore, the Ethnobotany Index (EI) is given as 4.85%. Additionally, during the interviews, as well as in local literature, a total of 26 plant species were mentioned, which are used for other purposes such as fragrances, cleansers, disinfectants, insect repellents, housebuilding, weather forecasting, future prediction, good luck, against the evil eye (Appendix S3, S4). The interviewees reported 8 plant taxa, while 21 taxa have been recorded from the local folk literature, with only two of them being common (*Pelargonium graveolens* and *Pistacia lentiscus*); however, they were used for different purposes.

Table 1. Comparison between plant taxa reported in interviews and plant taxa cited in local folk literature. Abbreviations are: N. taxa, total number of taxa; N. nat, Number of native taxa; N. cult, number of cultivated taxa; Ratio, N. nat/N. cult; N. fam, total number of families; N. ten, number of families of the 10 most popular species; N. eight, number of species of the 8 most popular families.

	N. taxa	N. nat	N. cult	Ratio	N. fam.	N. ten	N. eight
Interviews	45	24	20	1.2	24	6	29
Local folk literature	47	30	16	1.87	30	8	25

The most popular families of plants mentioned in interviews are Lamiaceae (10 taxa), Solanaceae (5 taxa), Asteraceae and Poaceae (3 taxa each). In detail, the ranking of the 24 total families mentioned in interviews is shown in Figure S2. The plant families mentioned most frequently in local folk literature are Lamiaceae (5 taxa), Solanaceae, Asteraceae and Poaceae with 4 plant taxa each and Alliaceae, Apiaceae, Cucurbitaceae and Fabaceae with 2 plants each. In detail, the frequency ranking of the 30 total families in literature is shown in Figure S3.

According to the analysis, the most popular taxa of Milos are *Salvia fruticosa* (Lamiaceae)*, Matricaria recutita* (Asteraceae), *Pistacia lentiscus* (Anacardiaceae), *Mentha pulegium* (Lamiaceae) and *Hypericum triquetrifolium* (Hypericaceae), while taxa used for the greater number of ailments are *Matricaria recutita* (Asteraceae)*, Salvia fruticosa* (Lamiaceae), *Hypericum triquetrifolium* (Hypericaceae), *Mentha pulegium* (Lamiaceae) and *Pistacia lentiscus* (Anacardiaceae). None of the 35 Greek endemics found on the island was mentioned as pharmaceutical.

2. Data analysis

In the present survey, a total of 47 ailments are recorded. Most plant taxa reported in interviews and in literature are used to treat dermatological (23.13% and 10.7% respectively), gastrointestinal (18.11% and 11% respectively) and respiratory diseases (16.9% and 9.8% respectively) (Figures 1, 2). The most frequently reported ailments in interviews are sore throat (9 taxa are used for treatment), stomachache (7 taxa), diarrhea (6 taxa) and abscess (5 taxa). It is noteworthy that there is a veterinary indication among the taxa given in local literature although interviewees were not asked nor mentioned such use of plants. Furthermore, literature references do not include metabolic disorders, possibly due to the non-existence of this kind of diagnosis during 16th to 19th centuries. Medicinal plants mentioned in interviews do not include reptile bites, since these are treated directly by medical staff in the last decades. The number of plant taxa used for diseases/symptoms of the gastrointestinal tract, skin and respiratory system is double in interviews that in literature. It has been observed a more varied distribution of plants cited in local literature by type of disease (the number of plant taxa cited in literature used for ailments of the gastrointestinal tract, skin and respiratory system is half of the number from the interviews) and this leads us to the conclusion that older residents of the island were better aware of the pharmacological profile of each pharmaceutical plant species and used it in a more targeted way.

The medicinal plants from both categories (interviews and literature) were processed in various ways prior to their use. According to the number of formulations/elaborations prior to use, *Allium cepa*, is prepared in 5 ways, *Allium sativum*, *Citrus limon*, *Olea europea* subsp. *europea* and *Petroselinum crispum* are prepared in 3 ways, while *Capsicum annuum* subsp. *cayenne, Hordeum vulgare*, *Hyoscyamus albus*, *Malva sylvestris*, *Matricaria recutita*, *Origanum onites*, *Rosa damascena*, *Ruta graveolens*, *Solanum lycopersicum*, *Triticum* sp., *Urtica pilulifera* and *Vitis vinifera* are prepared in 2 ways.

The species elaborated in more than one way; hence that gave more types of pharmaceuticals formulations, were mainly cultivated species, probably because of their already known properties of physicochemical behavior in various treatments and their frequent use in cooking. The fact that the number of plants reported in interviews is similar to that of literature (45 and 47, respectively) and the fact that interviews refer to the 20th, while literature refers to 16th to 19th centuries, allows us to make comparisons and draw conclusions about the evolution of the pharmaceutical use of the species over this period of time.

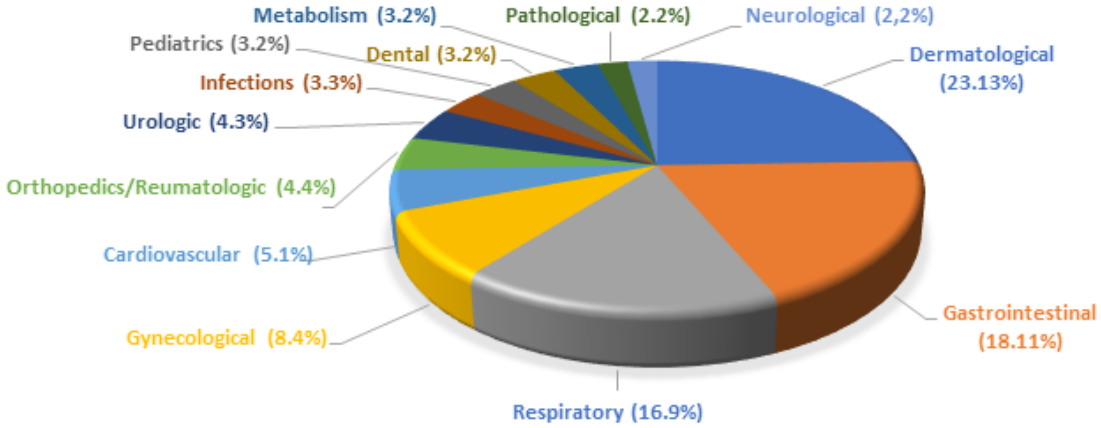

Figure 1. Distribution of native and cultivated plant taxa mentioned in interviews by disease type.

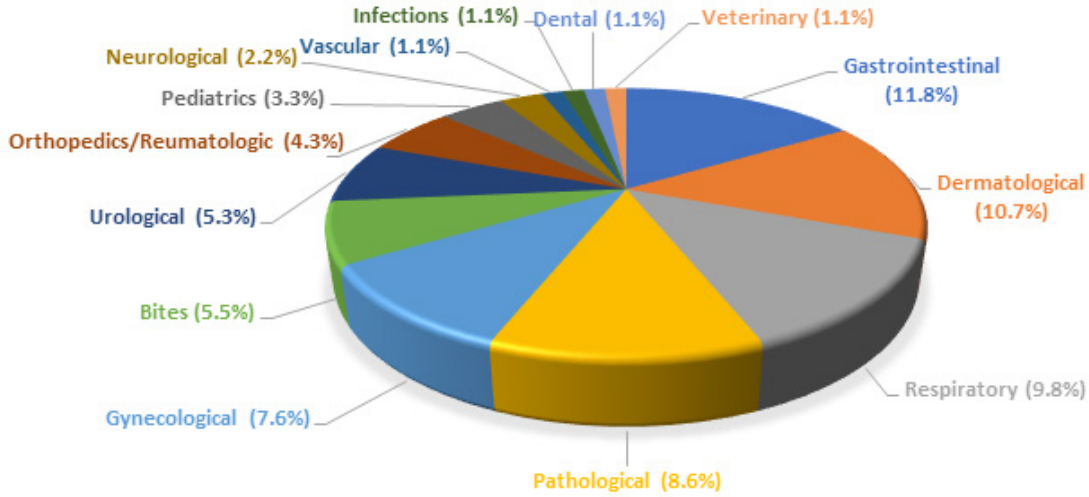

Figure 2. Distribution of native and cultivated plant taxa mentioned in literature by disease type.

According to literature data from the 16th to 19th centuries, more native taxa were used than cultivated ones, belonging to a greater number of plant families (larger dispersion). Data from the 20th century (interviews information) show that the pharmaceutical use of native species is reduced by 20% and cultivated use is increased by 25%. This is expected as cultivated species are easier to collect and since cultivated land increased, due to the arrival of farming tractors on the island. The spreading of the cultivated species has resulted in the displacement of the native ones to remote and inaccessible areas, the decrease of their population and, therefore, the increase in the difficulty to find and collecting them. At the same time, with the development of the pharmaceutical industry, traditional medicine was replaced by modern pharmaceutical methods and drugs. Sea transport development has also been significant, as well as the construction of the airport (1973), resulting in more accessible transport of patients to large urban centers (Syros, Piraeus, Athens), in the constant supply of medical equipment (and substances?) and thus the elimination of the island's general isolation. As a result, the tendency to accumulate the most used species from fewer plant families is increased. This tendency is shown in the last two columns of Table 1 and Figures S1, S2. Despite the reduction of native taxa pharmaceutic use and increase of cultivated, shown in Table 1, the native ones maintain the highest popularity and usability, as was shown by the analysis. This trend could be interpreted as an indication of greater confidence in the therapeutic potential of native plants by the inhabitants of the island.

In addition, as indicated in Table 2, 20 taxa were mentioned only in interviews and 22 taxa were reported exclusively in the literature. Among the common 24 taxa, only 9 have common indications, of which 6 of them are native (*Cynodon dactylon*, *Malva sylvestris*, *Matricaria recutita*, *Pistacia lentiscus*, *Rumex* spp., *Urtica pilulifera*) and 3 are cultivated (*Capsicum annuum*, *Vigna unguiculata*, *Vitis vinifera*).

3. Comparison with studies from neighbouring regions

Given the gradual arrival of Cretan refugees on the island from 1824 onwards (Belivanakis, 2007), the possibility of their influence on the habits of the local population was explored to explain, at least in part, the existence of the 20 new taxa mentioned in interviews that were not cited in literature. In order to achieve this, a juxtaposition was made between data from interviews and data presented in "Non-material Cultural Heritage and Biodiversity: Ethnobiological study in the Kissamos area in Crete" (Skoula *et al.*, 2010). This particular study was chosen because it refers to the area of Kissamos, which is geographically close to the area of Sfakia, where the Crete refugees came from. Two observations were made:

1) Only 37% of the plant taxa reported in interviews that Milos' inhabitants used, are included in the above study and even for the same indication, against 27% of the plant taxa reported in the literature.

2) Of the 20 taxa, which are reported only in interviews, 50% (10 taxa) are also reported as medicinal in the above study for the same indication (*Lavandula stoechas*, *Laurus nobilis, Platanus orientalis*, *Salvia fruticosa*, *Thymbra capitata*, *Cynara cardunculus, Eucalyptus globulus*, *Ocimum basilicum*, *Origanum majorana*, *Nicotiana tabacum*). This strengthens our initial assumption that the arrival of the Cretans on the island affected the phytopharmaceutical approach of the ailments.

Table 2. Comparative data between plant taxa used as pharmaceuticals referred in interviews and in literature.

	Total	Native	Cultivated
Common species between interviews and literature	24	13	11
Species present only in interviews	20	11	9
Species present only in literature	22	17	5

Conclusions

In the present study, important data was collected regarding the traditional pharmaceutical treatment of diseases on the island of Milos during the period from 16th to 21st centuries. These data reveal the gradual abandonment of traditional pharmaceutical methods using local native plants. All interviewed individuals said that most of the information they gave us was memories of ancestral habits rather than methods they use now. Hence, information collected here is very precious and must be preserved since it is part of human cultural heritage.

From 16th to 19th centuries, there was a full range of medical indications where plant species were used for treatment. During that time, local people also had deeper knowledge about the uses and the specialization of each one, so they "targeted" the cure of an ailment in a better way. However, in the 20th century the range was somehow restricted and native species used as medicines gave in to modern pharmaceuticals' development. It seems valid to conclude that Cretan refugees influenced plants' use(s) in folk local medicine.

As no corresponding ethnobotanical studies have been carried out on the nearby islands, it would be particularly interesting to make relevant comparisons in the future.

Ethnobotanical, biochemical and pharmacological studies verify the use of most of species used in Milos for the same or similar indications. Many of them have been used since ancient times for the same or similar medical indications, and a lot of them have been studied to isolate active substances and reuse them in standardized pharmaceutical formulations.

There are three plants of which no evidence of their use was found for the indications used on Milos, i.e. *Bryonia cretica* subsp. *dioica,* Cucurbitaceae for fistula, *Carlina gummifera*, Asteraceae for erysipelas and *Cistus creticus*, Cistaceae for dyspnea. We hope this study might initiate a research interest for a more thorough investigation of these plants.

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Supplementary material

Appendix S1. Cultivated taxa reported in interviews, including *Nicotiana tabacum*, non-native, non-cultivated taxa in Milos Island.

Appendix S2. Cultivated taxa reported in local folk literature, including *Glycyrrhiza glabra* non-native non-cultivated in Milos Island.

Appendix S3. Taxa cited in interviews for uses other than pharmaceuticals and food.

Appendix S4. Taxa cited in local folk literature for uses other than pharmaceuticals and food.

Figure S1. Total frequency of 40 families of 76 native and cultivated plant species that are/were in use on the island of Milos from 16th to 21st centuries.

Figure S2. Frequency classification of the 24 plant families mentioned in interviews.

Figure S3. Frequency classification of the 30 plant families mentioned in local folk literature of Milos.

Appendix 1. Native taxa reported in interviews. Abbreviations are: V.N., Voucher number (ACA); P.P., part of plant used; Season, collected season; E.A., Ellaboration-Administration; R.F., report frequency; I.N., indication number; U.V., use value.

Taxon Family	V.N.	Local name	Ailment	P.P.	Season	E.A.	R.F.	I.N.	U.V.	References
Convolvulus arvensis L. Convolvulaceae	8834	Kardouli'no	Heart diseases	Leaf	Whole year	Infusion - Drinking	1	1	0.08	Bites wounds antioxidant antibacterial liver protective (Al-Snafi, 2016)
Cynodon dactylon (L.) Pers. Poaceae	8664	'Avgoustos	Kidney stone bile diseases	Root	Summer	Infusion - Drinking	3	2	0.23	Antidiabetic antioxidant antidiarrheic immunoregulating antiulcer against cardiac arrhythmias liver protective activity CNS suppressive (Nagori & Solanki, 2011)
Ficus carica L. Moraceae	9592	Sikia'	Cough	Fruit	Summer	Syrup - Drinking	4	1	0.31	Liver spleen disturbances jaundice malaria fungal infections hyperlipidaemia (Vikas & Patil Vijay, 2011)
Hypericum triquetrifolium Turra Hypericaceae	8675	Agou'douras	Cold wound muscular pain	Flower	June	Extraction in olive oil - Rubbing	5	3	0.77	Antioxidant anti-inflammatory antibacterial (Guedes *et al.* 2012)
Juniperus phoenicea L. Cupressaceae	8676	Fi'da	Muscular and bone pain	Fruit	Spring	Extraction in olive oil - Rubbing	1	1	0.08	Muscular joint pains (Yaniv & Dudai, 2014)
Lavandula stoechas L. Lamiaceae	8670	'Agrio dentroli'vano	Increased blood sugars	Scape	Whole year	Infusion - Drinking	1	1	0.08	Hyperglycemia diabetes (Sebai *et al.* 2013)
Laurus nobilis L. Laureaceae		Da'fni	Stomachache	Leaf	Early spring	Infusion - Drinking	1	1	0.08	Gastroprotective (Afifi *et al.*, 1997)
Malva sylvestris L. Malvaceae	8679	Amolo'cha	Sore throat abdominal pain cough	Scape blossom	Late spring	Infusion - Drinking	5	3	0.46	Antioxidant anticancer anti-inflammatory against stomach ulcer (Gasparetto *et al.*, 2012)
			Abscess	Fruit	May	Decoction - Poultice				
Matricaria recutita L. Asteraceae	9514	Chamomi'li	Infant care	Flower	Spring	Extraction in olive oil - Rubbing	6	11	1.15	Antimicrobial liver protective anticonvulsant anxiolytic against itching ulcer polio leishmaniasis lice mouth ailments prevents osteoporosis (Singh *et al.*, 2011)
			Eye infections furuncles	Flower		Infusion - Compress				
			Abscess	Flower		Decoction - Poultice				
			Insomnia abdominal pain dysmenorrhea infants' relaxation indigestion sore throat	Flower		Infusion - Drinking gargles				
			Stomachache	Dried flower		Grinding - Poultice				

Taxon Family	V.N.	Local name	Ailment	P.P.	Season	E.A.	R.F.	I.N.	U.V.	References
Mentha pulegium L. Lamiaceae	9508	Fliskou'ni	Furuncle	Scape leaf flower	Spring	Infusion - Compress	5	6	0.62	Antibacterial anticonvulsant acaricide relaxing (Hadi *et al.*, 2017)
			Toothache stomachache dysmenorrhea cough infants' relaxation	Scape flower		Infusion - Drinking				
Mentha spicata L. Lamiaceae	9507	Dio'smos	Tachyar-rhythmia sore throat stomachache dysmenorrhea	Leaf	Whole year	Infusion - Drinking	5	4	0.46	Antibacterial antifungal properties against cancer (Raut & Karuppayil, 2014)
Mirabilis jalapa L. Nyctaginaceae	8666	'Erodas	Injuries wounds	Leaf	Whole year	Without elaboration - Patch	2	2	0.15	Injuries wounds healing hemorrhoids ulcer abscesses (Gogoi *et al.*, 2014)
Nicotiana glauca Graham Solanaceae	8678	Yatra'kos	Disinfection of abscesses	Leaf	Whole year	Mashing - Poultice	2	1	0.15	Antioxidant (Hassan *et al.* 2014); against parasitic diseases in humans and animals (Dos Santos Silva *et al.*, 2014)
Opuntia ficus-indica (L.) Mill. Cactaceae	9499	Barbarosikia'	Stomachache	Cladodium	Whole year fruit summer	Baking peeling sprinkling with cumin and pulverized dried chamomile's flowers - Patch	1	1	0.08	Antioxidant anti-inflammatory antidiabetic (Griffith, 2004) hangover (Osuna-Martínez *et al.*, 2014) ulcer diarrhea hemorrhoids cough (El-Mostafa *et al.*, 2014)
Pistacia lentiscus L. Anacardiaceae	8674	Ski'nos	Alopecia hair loss babies' seborrheic dermatitis	Scape	Spring	Infusion - Washing	6	5	0.62	Stomachache indigestion liver inflammation diabetes antirheumatic diuretic herpes jaundice eczema (Bozorgi *et al.*, 2013) hyperlipidemia (Nahida *et al*., 2012)
			Diarrhea sore throat	Scape Leaf Fruit	Late summer autumn	Infusion - Drinking				
Platanus orientalis L. Platanaceae	9503	Pla'tanos	Wounds	Leaf	Summer	Without elaboration - Patch	1	1	0.08	Hemostatic antidote to snake bites (Haider *et al.*, 2012) analgesic antinflammatory wound healing (Hajhashemi *et al.*, 2011)
Phagnalon rupestre (L.) DC. subsp. *graecum* (Boiss. & Heldr.) Batt. Asteraceae	8672	Kalohortia'	Kidney stones	Scape Leaf	Summer	Infusion - Drinking	1	1	0.08	Urinary system disturbances (Ali-Shtayeha *et al.*, 2000); rheumatism depression migraine (Hudaib *et al.*, 2008) cauterization of skin (Al-Khalil, 1995)

Taxon Family	V.N.	Local name	Ailment	P.P.	Season	E.A.	R.F.	I.N.	U.V.	References
Rosmarinus officinalis L. = *Salvia rosmarinus* (L.) Schleid. Lamiaceae	9571	Dedroli'vano	Babies' seborrheic dermatitis	Scape Leaf	Whole year	Infusion - Washing	4	2	0.31	Anticonvulsant for dysmenorrhea and kidney colic anticancer antifungal liver protective (Al-Sereiti *et al.*, 1999)
Rumex spp. Polygonaceae	9519	La'patho	Diarrhea	Fruit	Spring	Infusion - Drinking	1	1	0.08	Roots for constipation seeds for diarrhoea Leafs for skin disturbances antioxidant anticancer immune modulator anti-asthmatic (Sargin, 2015)
Ruta graveolens L. Rutaceae	8673	Api'yanos	Stomachache	Leaf		Infusion - Drinking	3	3	0.23	Antihyperglycemic anticancer antihyperlipidemic antidiabetic (Asparpanah & Khoshkam, 2012)
Salvia fruticosa Mill. Lamiaceae	8668	Fasko'milo	Cold blood pressure regulation stomachache dysmenorrhea lochia sore throat	Scape dried Leaf	Spring summer	Infusion - Drinking gargles	9	7	0.92	Antidiarrhoeic antiseptic diuretic hemostatic relaxing stimulates uterus (Gali-Muhtasib, 2006)
Teucrium capitatum L. Lamiaceae	8680	Despinovo'tano	Increased blood sugars	Aerial part	Spring summer	Infusion - Drinking	2	1	0.15	Blood glucose improvement (Zabihi *et al.*, 2018) antioxidant anticancer antimutagenic anticonvulsant anesthetist antibacterial antifungal reinforces memory (Bahramikia & Yazdanparast, 2012)
Thymbra capitata (L.) Cav. Lamiaceae	8667	Thima'ri	Sore throat	Aerial part with flowers	Late spring summer	Infusion - Gargles	3	4	0.31	Antiseptic (Figueiredo *et al.*, 2008); skin and mouth infections (Palmeira-de-Oliveira *et al.*, 2012); anticonvulsant against cough (Al-Qura'n, 2009)
			Toothache wounds	Aerial part with flower		Infusion - Washing				
			Cough	Aerial part with flower		Infusion - Drinking				
Urtica pilulifera L. Urticaceae	8835	Tsoukni'thra	Perniones (chilblains)	Whole plant	Winter	Infusion - Foot bath	2	2	0.15	Hemostatic anti-anemic antidiabetic diuretic (Greek flora 2020); antiasthmatic anti-inflammatory antiglycaemic against dandruff (Abo-elmatty *et al.*, 2013)
			Cough	Fruit	Spring	Infusion - Drinking				

Appendix 2. Native taxa reported in local folk literature. Abbreviations are: V.N., Voucher number (ACA); P.P., part of plant used; E.A., Ellaboration-Administration; I.N., indication number.

Taxon Family	V.N.	Local name	Ailment	P.P.	E.A.	Reference	I.N.	Reported literature uses
Adiantum capillus-veneris L. Pteridaceae	9580	Politri'hi	Amenorrhea	Scape leaf	Infusion - Drinking	Vaos 1982	1	Antidiabetic analgesic antiasthmatic antidiarrheic properties. Amenorrhea (Dehdari & Hajimehdipoor, 2018)
Artemisia arborescens L. Asteraceae	8836	Aspithia'	Malaria youthful acne	Leaf flower	Infusion - Drinking	Vaos 1982	2	Antinflammatory antipyretic (Sacco *et al*., 1983)
Bryonia cretica L. subsp. *dioic*a Cucurbitaceae	9576	Fistulo'horto	Fistula	Root	Unknown	Vaos 1982	1	Strong purgative (Dianthos, 2009; Belivanakis, 2007); edema epilepsy serpent's bite ulcer (Dianthos, 2009)
Capparis spinosa L. Capparaceae	8671	Ka'pari	Scorpion bite	Leaf	Cutting - Poultice	Vaos 1982	1	Immunostimulant anticancer antidiabetic antioxidant antibacterial antifungal antiparasitic activity (Tlili *et al.*, 2011)
Carlina gummifera (L.) Less. Asteraceae	9588	Amastihia'	Erysipelas	Root	Extraction in olive oil	Vaos 1982	1	Somnolence serpents' bite ulcer gastrointestinal parasites dropsy antipyretic diuretic laxative vomiting activity (Daniele *et al.*, 2005)
Cistus creticus L. Cistaceae	8665	Aghi'ssaros	Wheeziness	Flower	Infusion - Drinking	Vaos 1982	1	Antibacterial antifungal cytotoxic activity against leukemic cells (Pateraki & Kanellis, 2004)
Cynodon dactylon (L.) Pers. Poaceae	8664	'Avgustos	Diuretic (for nephrolithiasis)	Root	Infusion - Drinking	Vaos 1982	1	Antidiabetic antioxidant antidiarrheic immunoregulating antiulcer against cardiac arrhythmias liver protective activity CNS suppressive (Nagori & Solanki, 2011)
Datura stramonium L. Solanaceae	9515	Asmo'horto stramo'nio	Wheeziness	Dried flower	Cutting - Smoking	Vaos 1982	1	CNS stimulator respiratory tract congestion hair loss dental and skin problems. Antiasthmatic antinflammatory anticancer activity. Insect repellent vibriocide against *Vibrio cholera* used as antidote when exposed to organophosphorus (Soni *et al.*, 2012)
Ficus carica L. Moraceae	9566	Ornia' agriosikia'	Constipation	Dried fruit	Without elaboration - Eating or infusion - Drinking	Vaos 1982	2	Liver spleen disturbances jaundice malaria fungal infections hyperlipidemia (Vikas & Patil Vijay, 2011)
			Spleen edema (caused by malaria)	Cortex of stem	Without elaboration - Patch			

Taxon Family	V.N.	Local name	Ailment	P.P.	E.A.	Reference	I.N.	Reported literature uses
Hyoscyamus albus L. Solanaceae	9587	Diskia'mos	Tooth decay	Seed of dried plant	Burning - Channeling smoke to tooth	Vaos 1982	3	Anesthetic antipyretic properties. Asthma toothache muscular pain cough renal pain (Benhouda & Yahia, 2014)
Hypericum triquetrifolium Turra Hypericaceae	8675	Agu'duras	Diarrhea reduction of menstrual bleeding	Dried flower	Infusion - Drinking	Vaos 1982	2	Antioxidant anti-inflammatory antibacterial (Guedes *et al.*, 2012)
Juniperus macrocarpa Sibth. & Sm Cupressaceae	8669	Ke'dros	Scabies skin diseases	Scape leaf	Extraction in olive oil - Smearing	Vaos 1982; 1993	2	Activity against *Staphylococcus aureus Clostridium perfrigens* (Lesjaka *et al.*, 2014)
Malva sylvestris L. Malvaceae	8679	Amolo'ha	Expectorant for bronchitis sore throat	Scape flowers	Infusion - Drinking	Xidou 2012; Vaos 1982	2	Antioxidant anticancer antinflammatory against stomach ulcer (Gasparetto *et al.*, 2012)
Matricaria recutita L. Asteraceae	9560	Hamomi'li	Wound antiseptic	Flower	Infusion - Compress	Xidou 2012	2	Antimicrobial liver protective anticonvulsant anxiolytic against itching ulcer polio leishmaniasis lice mouth ailments prevents osteoporosis (Singh *et al.*, 2011)
Mentha pulegium L. Lamiaceae	9497	Flisku'ni	Diarrhea	Flower leaf	Infusion without sugar - Drinking	Vaos 1982	1	Antibacterial anticonvulsant acaricide relaxing (Hadi *et al.*, 2017)
Mentha spicata L. Lamiaceae	9594	Dio'smos	For interrupting breastfeeding	Leaf	Infusion - Drinking	Vaos 1982	1	Antibacterial antifungal anticancer (Raut & Karuppayil, 2014)
Opuntia ficus-indica (L.) Mill. Cactaceae	9565	Barbarosikia'	Spleen edema (caused by malaria)	Cladodium	Baking peeling sprinkling with cumin and pulverized dried chamomile's flowers - Patch	Vaos 1982	1	Antioxidant anti-inflammatory antidiabetic (Griffith 2004) hangover (Osuna-Martínez *et al.*, 2014) ulcer diarrhea hemorrhoids cough (El-Mostafa *et al.*, 2014)
Origanum onites L. Lamiaceae	9516	Ri'gani	Sore throat diarrhea	Leaf fruit	Infusion - Drinking	Vaos 1982	6	Analgesic (Aydin *et al.* 1986); bronchitis hypertension respiratory gastrointestinal disturbances menstruation problems diabetes cough headache (Tepe *et al.*, 2016)
			Abdominal pain spleen edema (caused by malaria) inflammations pain of internal organs	Leaf fruit	Boiling in red wine - Compress	Vaos 1982; 1993		
Papaver rhoeas L. Papaveraceae	8678	Paparu'na	Insomnia (adults children)	Seed	Infusion - Drinking	Vaos 1982	1	Relaxing analgesic somniferous against cough diarrhea symptoms of opioid detoxification (Kostic *et al.*, 2010); anticonvulsant inducer milk production against jaundice. Antimicrobial activity against *Staphylococcus aureus Staphylococcus epidermidis Klebsiella pneumonia Candida albicans* (Çoban *et al.*, 2017)

Taxon Family	V.N.	Local name	Ailment	P.P.	E.A.	Reference	I.N.	Reported literature uses
Pistacia lentiscus L. Anacardiaceae	8674	Shi'nos	Joint pains rheumatism	Fruit	Expression - Embrocation	Vaos 1982; 1993	2	Stomachache indigestion liver inflammation diabetes antireumatic diuretic herpes jaundice eczema (Bozorgi *et al.*, 2013) hyperlipidaemia (Nahida *et al.*, 2012)
Portulaca oleracea aggr. Portulacaceae	9505	Antra'kla	Joint pains rheumatism	Mature scape	Extraction in mixture of olive oil and petroleum - Embrocation	Vaos 1982	1	Cardiac arrhythmias intestine worms headaches stomach healer. Inhibitor of gastric acids (Olusina & Folashade, 2016)
			Gastroesophageal reflux	Leaf	Without elaboration - Eating			
Rosmarinus officinalis L. = *Salvia rosmarinus* (L.) Schleid. Lamiaceae	9564	Dendroli'vano	Amenorrhea giddiness	Scape leaf	Infusion - Drinking	Vaos 1982	2 1	Anticonvulsant for dysmenorrhea and kidney colic anticancer antifungal liver protective (Al-Sereiti *et al.*, 1999)
Rumex spp. Polygonaceae	9519a	La'patho	Diarrhea	Fruit	Infusion - Drinking	Xidou 2012		Roots for constipation seeds for diarrhea leaf for skin disturbances antioxidant anticancer immunomodulator anti-asthmatic (Sargin, 2015)
Ruta graveolens L. Rutaceae	8673	Api'ganos	Intestinal parasites (children)	Leaf	Infusion - Drinking	Vaos 1982; 1993	1	Antihyperglycemic anticancer antihyperlipidemic antidiabetic (Asparpanah & Khoshkam, 2012)
Satureja vulgare L. Lamiaceae	9586	Vassiliko's tis gis a'grios vassiliko's	Disinfection of suppurated abscesses	Leaf	Mashing - Poultice	Vaos 1982	1	Antibacterial (Opalchenova & Obreshkova, 1999) anticancer activity (Dzhambazov *et al.*, 2002) wound healing digestion regulation (Bianco *et al.*, 1984)
Sinapis arvensis L. Brassicaceae	9512	Sina'pi	Pleurisy	Seed	Mashing - Poultice	Vaos 1982	1	Its sperms contain quaternary ammonium sinapine iodide that is present also in *Draba nemorosa.* Chinese used traditionally *D. nemorosa* for the cure of pleurisy (Kung & Huang, 1949)
Sonchus oleraceus L. Asteraceae	9556	Tsoku's atsohio's	Snakes' bites	Leaf	Without elaboration - Patch	Vaos 1993	1	Antidiabetic antioxidant (Teugwa *et al.*, 2013) relaxing (Vilela *et al.*, 2009) anesthetic properties (Vilela *et al.*, 2010)
Urginea maritima (L.) Baker Hyacinthaceae	8677	Skilokremi'da kuvaraske'la	Causes abortion	Bulb	Infusion - Drinking	Vaos 1982	1	Abortion induction when used with other plant species (Merzouki *et al.*, 2000)

Taxon Family	V.N.	Local name	Ailment	P.P.	E.A.	Reference	I.N.	Reported literature uses
Urtica pilulifera L. Urticaceae	8835	Atsikni'da	Insomnia (adults children) dry cough	Seed	Infusion - Drinking	Vaos 1982	2	Hemostatic anti-anemic antidiabetic diuretic (Greek flora, 2020) antiasthmatic anti-inflammatory antiglycaemic against dandruff (Abo-elmatty *et al.*, 2013)
Vitex agnus-castus L. Verbenaceae	9511	Aligaria'	Insect bites	Leaf	Mashing - Poultice	Vaos 1982	1	Menstrual problems induction of milk production inhibits women's libido (Niroumand *et al.*, 2018)
				Cortex	Boiling - Poultice			