

Medicinal and Aromatic Plants of the World

Zohara Yaniv  
Nativ Dudai  
*Editors*

# Medicinal and Aromatic Plants of the Middle-East

 Springer

# **Medicinal and Aromatic Plants of the World**

Volume 2

## **Series Editor**

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University of West Hungary

Faculty of Agriculture and Food Sciences

Mosonmagyaróvár, Hungary

More information about this series at <http://www.springer.com/series/11192>

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Editors

# Medicinal and Aromatic Plants of the Middle-East

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ISSN 2352-6831

ISBN 978-94-017-9275-2

DOI 10.1007/978-94-017-9276-9

Springer Dordrecht Heidelberg New York London

ISSN 2352-684X (electronic)

ISBN 978-94-017-9276-9 (eBook)

Library of Congress Control Number: 2014949857

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Printed on acid-free paper

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# Preface

The use of medicinal plants as recognized therapies in modern health care has been increasing over the past three decades. Treatments that were considered “old wives tales” have been found to have underlying biochemical and even epigenetic foundations for their efficacy. The search for medically useful plants and the means to produce their active principles and ingredients now encompasses large research programs and even entire scientific institutes.

The series “Medicinal Plants of the World”, under the capable and thoughtful leadership of Prof. Dr. Ákos Máthé, is intended to bring the latest research to the attention of the broad range of botanists, ethnopharmacists, biochemists, plant and animal physiologists and others who will benefit from the information gathered therein. Plants know no political boundaries, and bringing specific folklore to general medical awareness can only be for the benefit of all. The current volume brings together chapters on medicinal plants of the Mediterranean region from researchers in Israel, Jordan and Turkey, and covers both wild (non-cultivated) and domestic (cultivated) crops with therapeutic value. Some of these plants are well-known medicinally, such as opium poppy and khat, while others such as apharesmon and citron have both ritual and medicinal uses. All have specific and valuable uses in modern society.

Bet-Dagan, Israel

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# Acknowledgments

In commissioning, collecting, and editing these chapters I have been greatly assisted by Nativ Dudai in locating authors, by Roy Amram and Prof. Uriel Bachrach in editing, by the staff of Springer Publishing in numerous technical details, and by Ákos Máthé in many general tasks. My profound thanks go to all of them and to the authors of the various chapters, with best wishes for continued good health for them and for the readers of this volume.





# Contents

<b>Introduction: Medicinal Plants in Ancient Traditions</b> .....	1
Zohara Yaniv	
<b>Wild Edible Plants in Israel Tradition Versus Cultivation</b> .....	9
Uri Mayer-Chissick and Efraim Lev	
<b>Ethnobotany Among Bedouin Tribes in the Middle East</b> .....	27
Aref Abu-Rabia	
<b>Endemic Aromatic Medicinal Plants in the Holy Land Vicinity</b> .....	37
Nativ Dudai and Zohara Yaniv	
<b><i>Capparis spinosa</i> – The Plant on the Wall</b> .....	59
Mina Faran	
<b>RETRACTED CHAPTER: Apharsemon, Myrrh and Olibanum:</b>	
<b>Ancient Medical Plants</b> .....	67
Shimshon Ben-Yehoshua and Lumír Ondřej Hanuš	
<b><i>Sarcopoterium spinosum</i></b> .....	151
Zalmen Henkin, Tovit Rosenzweig, and Zohara Yaniv	
<b>Traditional Uses of <i>Pistacia lentiscus</i> in Veterinary and Human Medicine</b> .....	163
S. Landau, H. Muklada, A. Markovics, and H. Azaizeh	
<b>Farming Amphetamines: Khat (<i>Catha edulis</i> Forsk.) a Traditional Plant with Mild Stimulating Psychoactive and Medicinal Properties</b> .....	181
Shimon Ben-Shabat, Pierre Goloubinoff, Nativ Dudai, and Efraim Lewinsohn	
<b>Citron Cultivation, Production and Uses in the Mediterranean Region</b> .....	199
Joshua D. Klein	

<b>Therapeutic Use of Aleppo Pine (<i>Pinus halepensis</i> Mill.)</b> .....	215
Gabriel Schiller	
<b>Pomegranate: Aspects Concerning Dynamics of Health Beneficial Phytochemicals and Therapeutic Properties with Respect to the Tree Cultivar and the Environment</b> .....	225
Doron Holland and Irit Bar-Ya'akov	
<b><i>Juniperus phoenicea</i> from Jordan</b> .....	241
Mohammad Sanad Abu-Darwish, Célia Cabral, and Lígia Salgueiro	
<b>Myrtle (<i>Myrtus communis</i> L.) – A Native Mediterranean and Cultured Crop Species</b> .....	253
Shmuel Zilkah and Eliezer E. Goldschmidt	
<b><i>Eruca sativa</i>, a Tasty Salad Herb with Health-Promoting Properties</b> .....	269
Oz Barazani and Jotham Ziffer-Berger	
<b>Oil Rose (<i>Rosa damascena</i>)</b> .....	281
Kemal Hüsnü Can Baser and Neset Arslan	
<b>Opium Poppy (<i>Papaver somniferum</i>)</b> .....	305
Kemal Hüsnü Can Baser and Neset Arslan	
<b>Retraction Note to: Apharsemon, Myrrh and Olibanum: Ancient Medical Plants</b> .....	E1
<b>Index</b> .....	333

# Introduction: Medicinal Plants in Ancient Traditions

Zohara Yaniv

**Abstract** Plants have been used for medicinal purposes since time immemorial, and to this day, many of the important and familiar remedies originate in plants.

This chapter outlines the history and early traditions of medicinal plants in the Middle-east. The importance of the early “medicine-men” in ancient cultures, as collectors and healers, is emphasized. Archaeological findings in sites such as Iraq and Babylon, as well as clay tablets and ancient manuscripts from Egypt, Sumaria and Assyria, India and China reveal the immense body of knowledge that existed during these old times in history.

A special place is devoted to the Bible, as an ancient document describing the use of plants in this region during biblical times.

Since before the Common Era, great herbalists, such as Dioscorides, Hippocrates, Theophrastus and Galenius acted as scientists and therapists leaving us with prominent books, such as *De Materia Medica* of Dioscorides. This priceless document provided the world with vast knowledge regarding hundreds of medicinal plants which are found in the region of the Middle-East. Most of these plants are still used at the present time for therapy and some of them are rich sources of natural compounds with medicinal properties.

It was only by the mid-fifteenth century that the influence of Dioscorides, and that of the classic herbalists, began to fade within European botany and medicine. During this period, and until our times, the European herbalists began researching plants for pure research purposes, which resulted in great scientific discoveries.

Although there is no doubting the predominance of chemical research in modern medicine, there is a notably increasing interest, within both medical circles and the general public alike, in plant-oriented folk medicine. Further research into the biochemical mechanisms of herbal medicines will enable a synthesis of traditional and modern methods of health care, to the benefit of all.

**Keywords** History • Tradition • Dioscorides • Bible • Galen • Egypt • Babylon • Middle-ages • Avicenna • Doctrine of signatures • India • Papyrus of Ebers

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## The History of Medicinal Plants

The gathering of medicinal plants is one of the oldest branches of the medical profession. It is most likely that at first there was no distinction between the gathering of plants for food and collecting them for medicinal needs, especially since most human food sources originated in plants. However, mankind has always suffered from various diseases and disabilities, and through trial and error, has unravelled, the medicinal value of plants.

In ancient cultures, as well as in primitive societies of our own time, the shamans, or medicine men, have combined their practical experience, knowledge of botany and psychology – with knowledge of witchcraft and various mystical ceremonies, through which they are claimed to have contact with the world of powerful spirits and occult wisdom. This gave them a unique position within the tribe, and attributed to them fantastic healing powers, including the ability to cure diseases and injuries, as well as to expel evil spirits which were believed to have invaded human bodies (Gordon 1977).

## Historical Findings

Archaeological findings at an ancient burial site in **Iraq** demonstrate the use of several plants that still serve in folk medicine today: yarrow, marshmallow, hyacinth, groundsel, thistle and ephedra.

In ancient **Babylon**, medical practice was one of the functions of priests. Evidence of the use of medicinal herbs has been found there in many archaeological excavations.

Clay tablets bearing medical prescriptions have been found in numerous **Sumerian** and **Babylonian** sites. In the laws of Hammurabi, king of Babylon in 1728 BCE, we find evidence of the use of medicinal plants such as cassia, henbane, liquorice, and varieties of mint, which continue to be used in folk medicine to the present day.

About 400 **Assyrian** remedies derived from plant and mineral sources are known today. One well-known Assyrian remedy is a resin derived from pine, which was used both externally as a muscle embrocation, and internally as a treatment for kidney and liver diseases. The Assyrians knew of the narcotic properties of poppy seeds and of the medicinal qualities of mandrake.

Medical prescriptions written on Egyptian papyri often include the various ingredients and their quantities. Ancient Egyptian medicine excelled in its “empirical-rational” approach, as part of the general Egyptian frame-of-mind.

The oldest medical document known is the papyrus of Ebers. It is dated to the sixteenth century BCE and was buried until its discovery, during the nineteenth century CE, in **Egypt**. The document contains 877 prescriptions and remedies, some of which include myrrh, frankincense, fennel and many other spice plants.

In **India** we find evidence of traditional folk medicine dating back to 1500 BCE, where it was passed on by word of mouth from father to son, for many generations, until it was included in the holy writings known as the Vedas. Many of the plants known in the Indian folklore were put to use by the Egyptians and by the Greeks after them, and, ultimately, found their way into European folk medicine as well (Savnur 1984).

The Chinese, as long as 5,000 years ago, were accustomed to drinking tea made from a leafless creeper known as “Ma-Huang” (*Ephedra sinica*), as a treatment for lung diseases. An ancient Chinese book, written in 2900 BCE, includes 365 remedies, and particularly specifies the value of this tea, which accelerates the circulation of the blood, reduces fever and relieves coughing; its main importance, however, was in clearing disturbances in the respiratory system. ‘Ephedrine’ was first extracted from this plant in the nineteenth century. The compound is still used as an important medication for asthma, various allergies and influenza to this day (Lee 2011).

The Chinese, and with them the Indians, contributed to the world the use of cannabis (hashish), which is known today mainly for its narcotic qualities, but which for thousands of years was famed for its medicinal properties, such as a cure for eye problems and pain relief.

We have only indirect evidence of the medicinal use of plants during the biblical period. Several plants which were known in the ancient Orient as medicinal plants are referred to in the Bible as sources of perfume; these include labdanum, tragacanth, myrrh and frankincense. Various poisonous plants mentioned in the Bible include mandrake, hemlock, wormwood and bitter apple, while spices mentioned include garlic, onion, cumin, hyssop and fennel. In spite of the fact that there is much evidence of the medicinal use of these plants in the region, there are no direct references in the Bible as to their usage for these purposes (Zohary 1982).

References to medicinal uses of plants in the Bible are usually episodic, with no discussion on the subject as such. For instance, the prophet Jeremiah mentions in three places the use of balm in the treatment of sores (Jeremiah, 8, 22; 46, 11; 51, 8). Various sources indicate that he was referring to a plant-resin which can be found in the Gilead; nowadays, it is considered to have been resin from the styrax. It could be that the lack of sustained attention to medicinal plants in the Bible stems from the belief that only the will of God cures mankind of its illnesses, and therefore, it does not necessarily indicate that there was no medicinal use of the plants at the time (Lev 2002; Palevitch and Yaniv 2000).

In contrast to the total of about 120 plants which are mentioned in the Bible, about 400 are introduced in the Mishnah and the Gemara, which together make up the Oral Law (Talmud). It is clear that until the period when the Talmud was codified (about 550 CE), the people of Israel had their own tradition of folk medicine, which they had not received from the neighboring peoples. Within the framework of this practice they must have used a large number of medicinal plants. In any case, the evidence of practical use of medicinal plants is much greater in the Talmud than in the Bible (Palevitch and Yaniv 2000; Duke 2007).

The ancient Greeks excelled in the field of herbal medicine and their heritage left its mark on European culture for hundreds of years to come.

Hippocrates (fourth century BCE) is considered to be the father of modern medicine. In his writings he lists about 300 medicinal plants. Some of these plants are used to this day in folk medicine, including: mint, poppy, sage, rosemary, rue and vervain.

Theophrastos (third century BCE), the Athenian botanist, studied the plants of Greece and the neighboring countries, and his book "Enquiry into Plants" was the pioneering work in both botanical research and in the history of medicinal plants. Some of his prescriptions are, in their essence, in use up to this day. In his book, he introduced details of the plants' appearances, their manner of cultivation, their classifications and their uses. Theophrastos is therefor known as "the Father of Botany" and his book has been used as a basic textbook for more than 2,000 years.

Dioscorides (first century BCE) was a Greek doctor who served in the Roman army in the days of the Caesar Nero. In his book, "De Materia Medica" he describes nearly 800 remedies derived from plant, animal and mineral sources, as well as directions of how to find them, the proper harvesting time, preparation procedures and medical designation. The book proved to be extremely influential in the West and laid the foundations for herbal medicine up to the Renaissance period (Gunther 1959). The Romans did not introduce many innovations to the field of herbal medicine and, as in other issues, mainly derived their knowledge from the Ancient East and especially from the Greeks. Both Greeks and Romans used medicinally active plants for production of cosmetics, extraction of perfumes, and as edible spices. Much of this information was gathered by Pliny the Elder (79–23 BCE), in his book, "Natural History", a compilation of information from about 2,000 Greek and Roman manuscripts. Pliny's writings, although not exclusively medicinal, do contain some information on the use of plant-derived medicine.

The influence of Galen (131 BCE) persisted in the medical world for many centuries. Many of his treatments included the use of medicinal plants. Plant-based remedies to this day bear the heading "Galenic medicine". After the fall of the Roman Empire, the active development of medicine, including the medicinal use of plants, ceased in the West; early Christianity believed that diseases were divine punishment for sins, and that their cure was a matter for Heaven and not for mankind to tamper with.

In sharp contrast to the "all in God's hands" approach, Arabic/Muslim medicine flourished during the seventh century CE on, up to its peak at the eleventh century CE, influenced mainly by the ancient medicinal practices of Mesopotamia, Greece and India. Many principles of Arabic medicine, including the use of medicinal plants, are widespread today among many millions of people across North Africa, Europe and Asia. Although ancient Arab medicine had inherited traditions from Greek and Roman practices, it extended the use of plants, and introduced many which had not been known previously in the West.

Among the outstanding figures of that period was Avicenna (980–1037 CE), whose book "Canon of Medicine" would later provide the basis for medical schools in Europe. For instance, Avicenna recommended the use of groundsel as a purgative for clearing the gall bladder, and to this day this plant is widely used in medicine, as a remedy for stomach aches and for improving digestion.

Ibn el Beithar (1197–1248), a famous Arab doctor, wrote a wide-ranging book on medicinal plants; in it he describes the medical practices of Dioscorides and Galen, and introduces additional information from his own research. His book was written with extreme clarity, and was ordered alphabetically for ease of use. It specifies the names of the remedies and of the plants in various languages, thus providing a first class tool for comparative research of medicinal plants.

Maimonides (Moses ben Maimon, known by the Hebrew acronym Rambam 1134–1240), in addition to his vast publications in the fields of Torah and Jewish Law (Halachah), published numerous medical books such as “The Book on Asthma”, “Poisonous Drugs” and “Names of Medicines”, which were considered the epitome of advanced medicine at that time. These books attribute great importance to the use of medicinal plants, several hundred of which are mentioned in Maimonides’ writings (Lev and Amar 2000).

In medieval Europe, knowledge of medicinal plants was preserved mainly in the monasteries. The monks grew medicinal plants with great dedication in the monastery gardens, and also knew of their natural habitats. They gathered and dried the plants, extracted essential oils from them, and used them for medicinal treatment according to the traditions of the Greek and Roman manuscripts, which they had copied and translated with great diligence, drawings included (Lev 2008).

The moratorium on medicine in Europe was total in the early to mid-Middle Ages, and even the “Black Plague”, which spread across Europe during the mid-fourteenth century, did not encourage fresh research into the causes of the disease. As mentioned previously, Christian belief was that disease was a punishment ministered directly by God. However, many people did hang bunches of bay leaves, dill, mint, roses and other aromatic plants above entrances to hospitals and houses, because these were believed to fend off the plague by power of their fragrance. It would later be known that some of these plants do possess disinfecting properties. In Europe of the Middle-Ages, grave importance was attributed to plants of the Solanaceae family: mandrake, henbane, stinkweed and belladonna. These plants owe their medicinal characteristics to the high concentration of tropane alkaloids in them. These were mainly used during the Middle Ages for witchcraft and magic, due to their hallucinogenic, anesthetic and poisonous properties. For this reason, later medical publications would refuse to include them in an authorized list of medicinal plants, in spite of their medicinal importance. It should be noted that several plants of the Solanaceae family, especially belladonna, are used up to this day in folk medicine, while in modern medicine they are sources of indispensable drugs such as atropine and scopolamine.

In medieval Europe, an interesting philosophy of herbal medicine was developed, called the “Doctrine of Signatures”. It was first introduced by herbalists many years before, but was documented in writing by Paracelsus, a Swiss fifteenth century doctor. He believed that plants were created to serve mankind, and that they had been given their forms by the Divine Creator in accordance with the objective that they were to serve. Thus, heart-shaped leaves and flowers were believed to be designated for treatment of heart diseases; kidney-shaped fruits, such as pulses, were to treat diseases of the kidneys. Red flowers and plants with red juice, such as



pomegranate, were considered excellent for treatment of problems in blood circulation; yellow plants or those with yellow juice were to be beneficial for curing jaundice; walnuts, which resemble the skull, were used for treatment of illnesses related to the head; hairy plants would benefit the hair; plants which produce white milky juice would promote the production of milk in the breasts of nursing mothers; long-lived plants would bring long life to those who ate them, and the list goes on and on.

It was only by the mid-fifteenth century that the influence of Dioscorides, and that of the classic herbalists, began to fade within European botany and medicine. During this period, the European herbalists began researching plants for pure research purposes, which resulted in descriptions and drawings of plant life worldwide, as advances in ship-building technology allowed Europeans to begin exploring the globe. Although there is no doubting the predominance of chemical research in modern medicine, there is a notably increasing interest, within both medical circles and the general public alike, in plant-oriented folk medicine. Further research into the biochemical mechanisms of herbal medicines will enable a synthesis of traditional and modern methods of health care, to the benefit of all (Yaniv and Bachrach 2005).

No-one expects to turn-back time nor to ignore the achievements of modern science, or to restore folk-medicine dominancy into society, just because its use has persisted throughout the long history of mankind. Nevertheless, in spite of the mystery and magic associated with the practice of herbal medicine, the centuries-old traditions and knowledge of herbal practitioners has been passed down to us; practices and methods that has been tested throughout time and tradition hold an invaluable source for further developments, in both herbal and conventional medicine.

These days there is an ongoing growth in the worldwide market of plant-based cosmetics and of over-the-counter, non-prescription herbal medicine. However, the marketing and administration of such products are subjected to strict supervision of the appropriate authorities (Palevitch and Yaniv 2000).

It is important to carry on the knowledge of traditional practices in order to develop new remedies for modern use. The process is not easy. It involves, first, the proper cultivation of selected plants with a commercial and medicinal potential, using controlled production methods. The next step involves modern extracting methods. The purpose is to come up with an active fraction or, if possible, a purified active compound. At this stage tests aimed at standardizing the compound and testing for toxicity and validity of function should follow.

Last but not least is the need to get a health permit from health authorities in the different countries.

This long and rather expensive process can explain the slow release of new herbal supplements into today's markets. However, in view of the immense potential contribution of this research we hope that in spite of the difficulties the search for new herbal remedies will continue.

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# Wild Edible Plants in Israel Tradition Versus Cultivation

Uri Mayer-Chissick and Efraim Lev

**Abstract** Studying the traditional knowledge of gathering wild edible plants around the world might teach us a great deal about the patterns of domestication and the connections between wild edible plants and “domesticated” cultivated plants. It is even more important and relevant if we consider that until not long ago, gathering of wild edible plants was a core daily practice, alongside the practice of agriculture and that the source if all our cultivated plants are gathered wild plants.

Gathering edible plants is a well-known habit among both the local Arab and the Jewish population and folklore. In the Land of Israel this tradition is in rapid decline due to excessive commercial gathering that almost brought to extinction some of the plants. The continuous urbanization of traditional communities also contributes to the loss of foraging knowledge and traditions. The wild edible plants and the traditions connected to their use can teach us a lot about different issues and raise questions about the co-evolution between humans, agriculture and wild edible plants.

**Keywords** Israel • Traditional knowledge • Gathering • Wild edible plants • Foraging • Cultivated plants • Malva • Marjoram

## Introduction

The study of traditional knowledge concerning the gathering of wild edible plants anywhere in the world, can teach us a great deal about the relationship between wild edible plants and “domesticated” cultivated plants. It is important and relevant if we consider that until not long ago, gathering of wild edible plants was a core daily practice, side by side with the practice of agriculture.

Babai and Molnár (2013) studied the traditional habitat knowledge in Gyimes, Eastern Carpathians, Romania. They found that the locals used a rich and sophisticated vocabulary to name and describe habitat categories. They distinguished altogether at least 142–148 habitat types, and named them by 242 habitat terms, which implies that their traditional ecological knowledge was wide. Their rich

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vocabulary helped to explain the habitat preference of a particular wild plant species. Their diverse knowledge was a fundamental part in the tradition of gathering wild edible plants in their area.

All over the world, the decline in the traditional gathering of wild edible plants caused the loss of the vocabulary used to describe the acts of gathering and the natural habitats of wild edible plants. There are less and less places like Gyimes where this knowledge is preserved. In the Land of Israel this tradition is in rapid decline. However, some attempts are made to recover and preserve the local knowledge of gathering wild edible plants (Dafni 1985; Mayer-Chissick 2010), even though the Land of Israel is one of the best locations for the study of the co-evolution of human and edible plants in general. The land is situated in the center of the Fertile Crescent and there are many archeological sites that shed light over the beginning of agriculture, the inhabitants of the land had been collecting edible plants, along the history, for their nutrition at the diverse regions, as parallel processes.

Plant remains had been found in prehistoric sites with some evidences of being consumed by humans. The plant assemblage of the Acheulian site of Gesher Benot Ya'aqov, for example, includes nuts of Atlantic Pistacio (*Pistacia atlantica*), acorns of Mt. Tabor Oak (*Quercus ithaburensis*), and wild Almonds (*Amygdalus communis*) are thought to have been consumed by humans (Goren-Inbar et al. 2002).

Hence, the large Mousterian carbonized plant assemblage retrieved during the excavations at Kebara cave fills a major gap in our knowledge of Middle Paleolithic gathering. It also provides critical information about subsistence strategies, thus, a fuller picture of Middle Paleolithic foraging as practiced by the Kebara inhabitants is achieved due to the fortuitous preservation of plant remains. The plant remains found in the Kebara cave including few thousands seeds of legumes, half a dozen cereals, few nuts of Atlantic Pistacio, and few parts of acorns of Mt. Tabor Oak seem to indicate that the inhabitants had a sufficient supply of all necessary elements for a healthy diet, available mostly during spring, early summer and fall. Although legumes are potentially suited for starting fires (morphological characteristics such as small leaves, and narrow stems) we believe that most were brought into the cave when ripe or almost ripe, and the presence of thousands of charred seeds strongly suggests that they were used for human consumption (Lev 2008).

In addition to the prehistoric remains indicating wild plants consumption in the area in the far past, vegetal food gathering could be studied from vast historical sources describing the phenomena and from plants remains found in archeological sites all over the country.

The Land of Israel is especially diverse in its nature, mainly due to its geographic location at the meeting point of three continents (Asia, Africa, Europe). Its special climate, influenced by the temperate Mediterranean on the one hand and the arid Arabian and Asian deserts on the other, and its particular topographic structure, including the Rift Valley, have contributed to the area's richness of flora and fauna. Different climatic, phyto-geographic, and zoo-geographic zones – Mediterranean, Irano-Turanian, Saharo-Arabian and Sudanian – converge here, creating enormous biological diversity (Mendelssohn and Yom-Tov 1999). About 2,700 plant species are to be found, of which 150 (5.5 %) are recorded as endemic (Shmida 1982) and more than 185 as edible plants (Dafni 1985).

The ethnic groups which compose this impressive mosaic in the Holy Land retained to varying degrees their languages, religions, clothing, ceremonial customs, traditional medicine and traditional food including the consumption of wild plants (Lev 2006).

In the early spring one can not miss, while driving through the country, many Arab families mostly the women wondering around the roadsides of the fields and gathering many different kinds of wild edible plants. A few studies had proven the health benefits of diet consisting wild plants in preventing some of the health problems of the modern civilization (Abu-Rabia 2005). Gathering edible plants is well known habit both among the local Arab and Jewish population and folklore.

According to Jewish religious the habit of wild plants gathering is one of the ways to deal with the rabbinical law of the “Shmita” (Huchberg 2000a, b), the last year in a 7-year cycle during which lands in Israel must lie fallow and debts are canceled. But this traditional way is also declining in the modern world when vegetables can be grown in special technology not involving ground and bought from the Moslems around the country.

The tradition of gathering wild edible plant is disturbed by the modernization of the Arab village, the invention of the fridge for example, enable the family to pick more than the amount needed for the season and freeze it for the summer. This excessive gathering combined with the growth of the community brought almost to a disappearance of some of the plants, and some of them like the wild (Syrian) marjoram (*Origanum syriacum*) and the tumble thistle (*Gundelia tournefortii*) had to be declared protected by law and their gathering is forbidden.

Among the most important sources in Rabbinical literature we have used the *Mishnah* (the six orders of the *Mishnah* are an assembled legal code arranged by topics most relevant to Jewish life such as agriculture, festivals, civil law, etc.) written by the *tannaim*, namely third-century CE Jewish Sages. Then come the Talmud, the Talmud is a commentary on the *Mishnah* and the *Tosefta* (laws added to the Mishnaic corpus). The final dates for the editing of the *Yerushalmi* (i.e., Palestinian) reflects very little reality after the early to mid-fifth century CE. The Talmud was written by the *amoraim*, namely later Jewish Sages of the late Roman and the Byzantine periods (the latter in the Land of Israel dates from 324 CE to 638 CE, the year of the Muslim conquest).

The plants presented here were selected because they represent different issues and raise questions of the co-evolution between humans, agriculture and wild edible plants. Descriptions, origin and ecology of all plants presented here are mostly taken from the Flora Palaestina (Zohary 1966–1986).

The popular and thus important wild edible plant in the area according to the tradition is *Origanum syriacum* and *Gundelia tournefortii*, two plants that are still picked today and that are in danger of extinction due to commercial gathering. *Asparagus aphyllus* and *Pisum fulvum*, plants that were cultivated through history but are not grown intensively anymore are only picked in the wild nowadays. These are examples of plants that give us clues to the beginning of cultivation *Arum palaestinum*, *Malva nicaeensis* and *Quercus ithaburensis* are more examples of common wild edible plants in the area.

## Specimen Monographs

### *Malva*

Both in Hebrew and Arabic the names of *Malva* come from the same lingual root that the word 'bread' comes from, the root that represent in the Semitic languages the most important foods: bread or meat. This connection points to the significance of the plant as a central food in the local tradition of gathering wild edible plants.

**Description** Annual or biennial herb with upright and hairy stem (up to 60 cm). The leaves are big (up to 12 cm), wide and have several slight lobes along the edges. Flowers are with pink or purple. The fruits are disc-shaped and has several segments (Table 1).

**Local Gastronomy** The Leaves are eaten raw or cooked and according to the local tradition the seeds were picked when dry, and then grinded and used as flour.

**Local Folklore** The *Malva* is considered to be the most important wild edible plant in the local gathering tradition. A lot of tales are connected to its ability to help people in nutritional stress, as well as to its high nutritional value (Picture 1).

### *Syrian Marjoram*

The Syrian marjoram (Picture 2) is one of the most popular seasoning plants in Israel and is the main ingredient in the local blend of the za'atar spice that is called after the plant name in Arabic. It has been declared a protected species in Israel as early as 1977, and that protection proved a key factor in its survival as a wild plant.

**Description** Woody based perennial, 30–50 cm tall, with soft-woolly, glandular hairs. Stems erect, rigid paniculately branched on upper part. Leaves short-petiole, ovate, rather thick. Spikes oblong. Corolla white, 4 mm long, tube exerted from calyx (Table 2).

**Table 1** Botanical features of *Malva*

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Malva nicaeensis</i>	Malvaceae	E. Mediterranean	Batha, garigue and fallow fields	Hebrew: helmit Arabic: <i>hubeza</i>	Leaves and seeds	December–May

**Picture 1** *Malva nicaeensis*



**Picture 2** Syrian marjoram

**Table 2** Botanical features of Syrian marjoram

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Origanum syriacum</i> (= <i>Majoran syriaca</i> )	Labiatae	E. Mediterranean	Batha and garigue on rocky hills; rarely on walls	Hebrew: 'Ezov Arabic: Za'tar	Leaves	March–May

**Sensorial Botany** Branches and leaves are hairy and scanted when touched, their test is bitter.

**Local Gastronomy** The leaves are dry grounded and blend with salt, olive oil, local sumac (*Rhus coriaria*) fruits and sesame (*Sesamum indicum*) seeds in to a very popular spies called za'atar that is served mostly with pita bread. The fresh leaves are also used in moderation (to much is bitter) as seasoning in different dishes.

**Local Folklore** Wild marjoram or Syrian hyssop are mentioned in the bible (Exodus 12:21–22; I Kings 4:33; Psalms 51:7) and in the New Testimony (John 19:28–30). Zohary (1982) argues it was used to treat leprosy (Leviticus 14:4) and for worship (Number 19:6). The wild marjoram traditionally used by the Samaritans to sprinkle the blood of the Passover sacrifice.

Marjoram was used in the past for heating, and the wild species is a main substance in the famous eastern spice called ‘za’atar.’ Ibn Masawayh (1932–1933) suggested using ‘marzangosh’ oil while staying in the hot bathhouse (hamam). Arab villagers (‘fellahin’) used to pad their shoes with wild marjoram leaves in the winter for warmth and disinfection of the feet. The seeds of the plant consist of ethereal oils used in the food and cosmetic industries (Alon 1982–1990).

Syrian marjoram is one of the typical plants of the Land of Israel. Its use as a traditional spice is very common among all the local inhabitants until the present day. Large quantities of the plant and its products are exported to neighboring Arab countries and for this reason it has been declared a protected species in Israel (Lev 2002).

### *Tumble Thistle*

This plant that was gathered in the area throughout history has been declared a protected species in Israel due to an excessive commercial gathering in the beginning of the second millennium. After a complicated debate between traditional local gatherers and the authorities and a partial success of its cultivation, the limits on its gathering were reduced and enabled the restoration of its existence in some reserved areas.

**Description** Perennial herb, 30–50 cm tall, cobwebbed to almost hairless. Stem thick, breaking off near base at maturity, than the whole plant is rolled by wind (tumbleweed). Leaves are large, rigid, thick & oblong (Picture 3). Leaf lobes are spiny-toothed. Head compound, ovoid, 4–8 cm across. Head bracts are cobwebbed ending in a strong spine. Florets dull purple outside, yellow inside, anthers yellow (Table 3).



**Picture 3** Tumble thistle



**Table 3** Botanical features of tumble thistle

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Gundelia tournefortii</i>	Asteraceae	W. Irano-Turanian, invading E. Mediterranean	Batha, tragacanth vegetation, open steppe forests, fallow fields and steppes	Hebrew: 'Akavit <i>ha-galgal</i> Arabic: 'Akkub <sup>a</sup>	Young leaves, shoots, and inflorescence	Early winter (young leaves) Early spring (stems and inflorescence)

<sup>a</sup>Bailey and Damir (1981)

**Sensorial Botany** The green soft young leaves in the winter become hard brown spiny towards the end of the spring.

**Local Gastronomy** The leaves of the plant are eaten while they are still green, they are picked and after they had been cleaned they are fried with onion and spices. The stems and inflorescence are made into few different dishes, fried, boiled with meet or grilled with meet (Buchman 1993; Dafni 1985). The seeds are rich in fats and are edible (Lev Yadun and Abbo 1999). In Turkey they use it sometimes as a coffee substitute (Dafni 1984, 1985; Uphof 1968).

**Local Folklore** Most biblical researchers think that this is the plant referred to in the Bible: "... as a wheel, as the stubble before the wind" (Psalms 83:14) The Hebrew name meaning wheel and resembles the way of seed spreading of the plant when the plant rolls in the wind (Buchman 1993).

The Mishna recognizes and categorizes the plant as a special wild plant that is edible for humans (Mishna, Okatzim, 3). During the Byzantine period, the Tumble thistle seeds were an important component in the food of monks in the Judean desert (Herschfeld 1991). According to the Jerusalem geographer, al-Muqaddasi (1906), the plant was one of the plant species with which "Falastin" was favored. The plant has been declared a protected species in Israel due to an excessive gathering.

## *Pricky Asparagus*

Wild Asparagus is an expensive foodstuff because of its short shelf life. It is still gathered according to local tradition but not for commercial use and mostly for self-consumption. This allows its survival in the wild.

**Description** Climbing perennial herb (to 1 m tall) with a woody base and swollen roots. Stem spreadingly branched, branches angular. Lower scale-like leaves and phylloclades spreading, unequal 5–10 mm (Picture 4). Flowers 1–2, berry 6–7 mm in diameter, blackish (Table 4).

**Sensorial Botany** Phylloclades are spiny.

**Local Gastronomy** The young shoots are eaten fresh, fried with an egg or pickled in brine.

**Local Folklore** The asparagus was an agricultural crop in the Land of Israel that was explicitly mentioned from the early Islamic period (Amar 2000). Various species of asparagus are climbing plants in the woody groves of the Land of Israel, and some of them are used for food until today (Dafni 1985).

The medical use of asparagus was mainly as a diuretic drug, to relieve pain, to increase sperm and also to fatten. These uses have been preserved in the framework of traditional medicine in the region until today (Lev 2002). The Hebrew name of the species is derived from the scientific name that originates from ancient Greek (Lev 2002).



**Picture 4** Prickly Asparagus (Taken by: Ramon Casha and Flicker)

**Table 4** Botanical features of Prickly Asparagus

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Asparagus aphyllus</i>	Liliaceae	S. and E. Mediterranean	Batha and maquis, among rocks	Hebrew: <i>Asparagus</i> Arabic: <i>Halyi</i>	Young shoots	Early spring

### ***Yellow Wild Pea***

Although wild pea and other wild legumes are still spread in the wild in the Levant, they are not widely picked by local gatherers any more. This is due to the high labor needed to pick a quantity that is satisfying nutritionally. Abbo et al. (2008) asked in their research, what guided the cultivation process of wild pea? They got the best yield gathered from the *Pisum fulvum*, 500 g. of dried in an hour of work, which is definitely not a lot. However, this was most probably not the reason for the cultivation of the pea because although *Pisum fulvum* was the best yield it was not the specie that was cultivated.

**Description** Hairless annual (15–30 cm tall) with ascending or creeping stems. Leaves 6–12 cm long, spreading; stipules 2–3.5 cm long, ovate. Flowers to 1 cm long, rusty-yellow or reddish-brown. Pods are short beaked, seeds black, 4 mm across (Table 5).

**Sensorial Botany** Seeds and pods are green, moisture and soft in winter time and become hard and brown towards the end of the spring.

**Table 5** Botanical features of yellow wild pea

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Pisum fulvum</i>	Fabaceae	E. Mediterranean	Batha, garigue and fallow fields	Hebrew: Afun	Young leaves, seeds and pods	February–May
				Arabic: <i>Bazilla</i>		

**Picture 5** Yellow wild pea

**Local Gastronomy** The legumes are eaten raw or cooked (Dafni 1985). Leaves are eaten raw.

**Local Folklore** Seeds of the plant were found in the Kebara cave (Mt. Carmel, Israel) and were reconstructed as part of the vegetal gathering diet of the Middle Paleolithic Humans that lived in the area (Lev 2008). Seeds were also found in sites from the sixth and seventh millennium BC around Turkey, Iraq and Israel (Ledizinsky 1985–1986) (Picture 5).

### *Palestine Arum*

Arum is known today as a poisonous plant, but was known through history as a highly valued edible plant nutritionally and medicinally. We learn from the local traditions to transform it from a poison to a healthy and delicious food.

**Description** Scapose perennial herb with tuber, 4–8 cm in diameter, long leaves, petiole 15–50 cm, longer than blade (Picture 6). Spathe (16–50 cm) with tube (3–6 cm) and 2.5–4.5 cm across, oblong, outer side green, inner side purple in its upper half and greenish in the lower. Appendage of spadix dark purple (Table 6).

**Picture 6** Palestine arum**Table 6** Botanical features of yellow Palenstine arum

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Arum palaestinum</i>	Araceae	E. Mediterranean	Batha, garigue and maquis edges; alluvial soils, rocky places	Hebrew: Luf Arabic: 'uḏn ilFil <sup>a</sup>	Leaf blades	Winter

<sup>a</sup>The Arabic name means “Elephant Ear” and is driven from the shape of the leaf (Dafni 1985)

**Sensorial Botany** Inflorescence mostly strong scented of decaying fruit and fermentation or even dung. In the tissues of the plant there are crystals of sodium acid (Sodium Oxalate) in the form of needle bunches. When the tissues disintegrate, the crystals remain in form of a white powder. There are also poisons in the foliage and the gourds that prevent it from being eaten, but roasting or cooking neutralizes these poisons (Alon 1982–1990; Uphof 1968; Dafni 1985; Crowfoot and Baldensperger 1932; Grieve 1994).

**Local Gastronomy** The stems are cut off from the leaves, leaf blades are cut into thin pieces, then cooked thoroughly with lemon or sorrel leaves (*Rumex* sp.) the acidity of the sorrel and the lemon helps to neutralize the leaf poisons. The cooked leaves are eaten with a flat bread and considered healthy and a delicacy.

**Local Folklore** Various species of arum growing in the Mediterranean Basin have served as food and medicine since early times in spite of their toxicity. In the temple of Thutmose III in Karnak there are engraved drawings of plants that were brought from Canaan in the year 1447 BCE, among which there were various species of arum (Krispil 1983–1989).

The plant is mentioned in Jewish rabbinical literature, and apparently they knew even then how to overcome its toxicity. Palestine arum was a cultivated crop and it

was customary to eat the leaves and the gourds that appeared perennially (for example: Mishna, Kilayim, 2:5). The gourds of the plant are also mentioned in connection with the sabbatical year (Mishna, Shevi'it, 5:3). The seeds of the gourd were not used for human consumption but only for birds (Mishna, Ma'aserot, 5:8) (Lev 2002).

Cooked leaves are considered a delicacy by the local Arabs, and a treatment for many diseases and especially for cancer. It is a commonplace among the Arabs of Israel that the cooked leaves of the plant kill intestinal worms even among animals, and also that they strengthen the bones of the body. Crushed leaves are used to treat infection in open wounds, obstructions in the urinary tract, and kidney stones (Krispil 1983–1989). The Jews of Iraq use the plant to cure skin sores, syphilis, rheumatism, tuberculosis, diarrhea, and stomach worms (Ben-Ya'akov 1992).

### *Mt. Tabor Oak*

Oaks are widely found in the region under research, and are very well known in the landscape. Oak was used in many different ways in local traditions. It was used for medicine, building, dying and more. The reason for it not being cultivated was researched and it was found that unlike the almond that has single dominant gene controlling its bitterness, the oak has many genes controlling its bitterness, which made it impossible to cultivate (Diamond 1997).

**Description** A tree that may reach a height of more than 10 m, and a trunk with a circumference of 6 m. The branches form a spherical crown. The bark of the branches and the trunk is gray-dark brown and it is hard with deep grooves. The leaves are 5–10 cm long. They are stiff, ovate, with dentate-thorny margins. The upper side of the leaf is shiny; its lower side is covered with felt-like hairs (Table 7).

**Local Gastronomy** The oak acorns are roasted and them grinded and used in various cooking technics (Picture 7).

**Local Folklore** Many traditional tales are told about the ability of the oak to provide food at times of scarcity. It is mentioned in the bible and forests of it covered large areas in the Galilee and on Coastal Plain in Israel, but these have been

**Table 7** Botanical features of Mt. Tabor Oak

Scientific name	Family	Origin	Ecology	Local folk name	Part(s) used in the local cuisine	Gathering period
<i>Quercus ithaburensis</i>	Fagaceae	Mediterranean	Heavy soils	Hebrew: Alon Arabic: Balut	Acorns	October–December