An-Najah National University
Faculty of Graduate Studies

An ethnobotanical study of wild edible plants in the Northern West Bank "Palestine"

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This Thesis was defended successfully on 3/6/2010, and approved by:

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Dedication

To my parents ... for encouragement,

Husband ... for patience,

Sisters, daughter & friends

with love and respect

Acknowledgments

I would like to express my sincere gratitude to my supervisor, Professor Mohamme S. Ali-Shtayeh for his supervision, encouragement, guidance and help throughout this work.

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الإقـــرار

أنا الموقعة أدناه مقدمة الرسالة التي تحمل العنوان:

An ethnobotanical study of wild edible plants in the Northern West Bank "Palestine"

دراسات في النباتات البرية التي تؤكل في شمال الضفة الغربية

اقر بأن ما اشتملت عليه هذه الرسالة إنما هو نتاج جهدي الخاص، باستثناء مـــا تمـــت الإشارة إليه حيثما ورد، وان هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة علمية أو بحث علمي أو بحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

Declaration

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

Student's name: **اسم الطالبة:**

Signature: **التوقيع:**

Date: **التاريخ:**

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An Ethnobotanical Study of Wild Edible Plants in the Northern West Bank "Palestine"

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Abstract

This ethnobotanical study of wild edible plants was conducted from Feberuary to August 2007 in six districts in the northern West Bank of Palestine. The study area included Nablus, Tulkarm, Qalqalia, Jenin, Salfit, and Tubas districts of the West Bank. The studied region is located within the semi costal, central high lands and the eastern slopes agroeclogical zones. This area is characterized by mild weather. The aim of this study was to document the indigenous ethnobotanical knowledge related to uses of wild edible plant species and the assessment of the existing threats to these plants, to identify the native and naturalized plants in respect to their utilization, as well as to evaluate the conservation status and cultivation potential. In addition, the study examined the antioxidant activity of *Majorana syriaca* using DPPH and β-carotene assays.

Information was collected from 215 informants from 39 villages in the different locations. Fifty eight wild edible plant species which are classified among 22 families and 55 genera were documented. Forty nine of these plants were mentioned by 3 informants and more were distributed across 20 families and 46 genera. The most widely used plants are: *(Majorana syriaca*, *Malva neglecta*, *Salvia hierosolymitana*, *Cyclamen persicum*, *Gundelia tournefortii*, *Coridothymus capitatus*, *Mentha spicata*, *Cichorium pumilumjacq*, *Teucrium polium*,and *Arum palaestinun*).

This study revealed that the Cultural important index (CI) of the studied plant species varied in the different localities. It indicated that *Majorana syriaca* ranked number one with a mCI value of 1.9683. Another group of species had a mCI value ranging between 0.5-0.9, these include: *Arum palaestinum, Centaurea dumulosa, Cichorium pumilumjacq, Gageachl orantha, Gundelia tournefortii, Malva sylvestris Matricaria aurea, Rumex acetosa, and Rumex Patientia, Salvia fruticosa, Salvia hierosolymitana, and Teucrium polium*.

Regarding the Cultural importance of the families, this study showed that Labiaetae is the most important family with 4.953 mCI, followed by Asteraceae (3.19 mCI), Polygonaceae (1.64 mCI), Araceae (.926 mCI), Primulaceae (0.92 mCI) and Brassicaceae with (0.81 mCI) value.

The antioxidant activity of *Majorana syriaca*, extract showed 50% inhibition of DPPH absorption, A total phenolic compound amount in thyme ethanolic extract was found to be 37.3μg mg-1 pyrocatechol equivalent, with a total flavonoids compound of 146μg mg-1 quercetin.

Regardless of the large number of reported plant species and their uses in both food and medicine, this study showed the need for protecting these species. In addition, a study of their side effects on human health is needed.

CHAPTER ONE

INTRODUCTION

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1.1 Definitions

Wild edible plants: Are wild plants with one or more parts that can be used for food if gathered at the appropriate stage of growth, and properly prepared. Edible wild plants could be weeds growing in urban areas to native plants growing in deep wilderness (Kallas, 1996).

Endangered species: is a population of an organism which is at risk of becoming extinct because it is either few in numbers, or threatened by changing environmental or predation parameters (Lee *et al*., 1999).

Ethnobotanical study: the study how people of a particular culture and religion make use of indigenous plants, and how they classify and identify them (Abdulrahaman *et al*.,2006).

Medicinal plant: is a plant which at least one of its parts contains substances that can be used for therapeutic purposes (Sofowora, 1982 and Bruneton, 1995)**.**

1.2 Ethnobotany of wild edible plants

The aim of Ethnobotany is to study how and why people use and conceptualize plants in their local environments. The most asked two questions are: how and in what ways people use nature and how and in what ways people view nature (Salmon,1999). Ethnobotanists gather data mainly from living peoples in hopes of gathering a view of their past

existence as well as an understanding of present uses of plants for food, medicine, construction materials, and tools. Ethnobotanical research can be a door into cultural realities as well as a way to understand the future of human relationships with this land.

The historical dimensions of ethnobotany that were largely listings of plants, names, and uses play a role in contemporary approaches to traditional plant knowledge. Most past researchers did not regard what the people thought about plants as important. The situation today is that researchers would like to include conceptualizations of plants in their studies, but do not have the methods to do this (Salmon,1999). This does not criticize ethnobotany, but rather attempts to build the framework upon which new methodological approaches can be explored (Salmon,1999).

Natural resources applied by human are influenced by different factors such as history, cultural system and the availability (Ladio & Lozada,2004). There are over 20,000 species of wild edible plants in the world, yet fewer than 20 species now provide 90% of our food. However, there are hundreds of less well known edible plants from all around the world which are both delicious and nutritious.

Plant tissues are considered as source of industry used in fibers for making cloth, rope, paper etc. Also there are numerous dyes obtained from plants mixed with different materials. Many plants have oil-rich seeds that have a variety of uses. These oils can be extracted, many of them are edible and they can also be used as Lubricants, fuel, for lighting, in paints and varnishes, as a wood preservative, waterproofing, etc (Fern,1997).

There has been renewed or increasing interest in consuming wild food plants. Despite agricultural societies' primary reliance on crop plants, the tradition of eating wild plants has not completely disappeared, their nutritional role and health benefits being reported in many surveys worldwide (Pardo-de-Santayana *et al*., 2007)**.**

In the Mediterranean area wild edible plants are important as dietary supplements, providing trace elements, vitamins and minerals. However, consumption is determined less by calorie input and more by the pleasure of gathering wild resources, recreating traditional practices and enjoying characteristic flavors (Pardo-de-Santayana *et al*., 2007)**.**

Both food and medicinal plants have interventional uses. This exists mainly in indigenous and local traditions. Food can be used as medicine and vice versa. However, certain wild edible plants are used because of their assumed health benefits and thus can be called medicinal foods. (Etkin,1994).For example, the leaves of *Teucrium polium* is consumed fried using olive oil because it is perceived to protect from cancer (Ali-Shtayeh *et al*., 2008).

The amount of vitamins, minerals and other nutrients in wild food, according to many sources, is on the average greater in wild foods..

Throughout the world, and more especially in developing countries, wild plants make an important contribution to the life of local communities. They play a significant part in a wide range of agricultural systems as a source of wild foods and fuel wood, and they have an

important socio-economic role through their use in medicines, dyes, poisons, shelter, fibers and religious and cultural ceremonies. Yet little systematic knowledge has been gathered on the uses of wild plants and they tend to be ignored in considerations of farming systems by extension workers, policy-makers and economists. Wild resources in general are often ignored and receive little recognition from the development community (Heywood & Skaula,1999).

The impact of local plant varieties on Palestine culture and economy is significant. Many wild plant species are extensively used in Palestine cuisine and many people, mostly in rural areas, still widely use medicinal plants for the treatment of burns, disease and other ailments (Heywood & Skaula,1999).

1.3 Wild edible plants in the Mediterranean area:

Wild edible plants have always been important in the folk traditions of the Mediterranean region (Hadjichambis *et al*., 2008). However, food and medicinal uses of these plants have been two of the most relevant and consistent reasons for popular plant management, even in cultures that are increasingly down their close relationship with nature. It is for this reason that ethno-directed research is very useful in the discovery and development of new drug and food resources. It is of outmost importance to obtain data about popular uses of wild edible plants before this knowledge disappears. In many Mediterranean countries these traditions

are at risk of disappearing, and hence the crucial need to study such knowledge systems (Ali-Shtayeh & Jamous, 2002).

The diet in the Eastern Mediterranean region, especially in Lebanon, Syria, and Jordan, is characterized by an increasing reliance on refined grains as the primary source of energy. As a result, these countries are also experiencing an increase in the rates of chronic diseases such as cardiovascular diseases and diabetes as, a reflection of the emerging nutrition transition (Batal & El-Fattal, 2006). The nutrition transition seems to be occurring along side chronic problems of under nutrition, specifically micronutrient deficiencies as reflected in high rates of anemia and stunting among certain subgroups, particularly by the urban and rural poor. During the years 2003–2006, a circum-Mediterranean ethnobotanical field survey for wild edible plants was conducted in selected sites in seven countries (Albania, Cyprus, Egypt, Greece, Italy, Morocco, and Spain) reported that *Lamiaceae, Rosaceae,* and *Apiaceae* were among the five families with the greater number of representative wild edible plants used in food and medicine in the Mediterranean countries. (Hadjichambis *et al*., 2008).

At the same time, the West Bank is blessed with great biodiversity and its population has access to potentially many wild edible plants that could be easily used to improve health and reduce the risk of disease. However, the harvesting and use of these wild plants is on the decline due to eroding knowledge, environmental degradation, and increasingly limited

open space. This is mainly because of modern agricultural practices and policies such as monocultures, and the heavy use of pesticides and changing land tenure regimes (Batal & El-Fattal, 2006).

In spite of the abundant information on inventories of wild edible taxa, there is a crucial need to understand the way these plants are utilized and how the consumtion of such edible plants changed by time and place Additionally, it is important to study such knowledge systems and find innovative ways of infusing them to the future Mediterranean generations (Hadjichambis *et al*., 2008).

The Mediterranean region, including Palestine, is one of the world's major centers of plant diversity. It houses approximately 25,000 species, about 50% of which are endemic to the region. It is one of the most important of eight centers of cultivated plant origin and diversity identified by Vavilov (1926), who listed more than 80 crops from the region, the most important of which are the cereal crops, fruit trees, and vegetables. Also found that many native species are economically less important including notably medicinal plants, herbs and spices. Neglected horticultural crops such as *Eruca sativa* and *Portulaca oleraceae*, all of which play an important role in local cultures (Heywood & Skoula,1999).

Some of theses plants worth more consideration for further development and improvement as crops for marginal areas. Many crop relatives occur in the Mediterranean basin including Palestine. These plants genetic resources are of actual or potential importance to agriculture,

various industries and human health, and consequently will improve the quality of life. The traditional use of wild edible plants assumes that such plant resources will continue to be available without any specific actions to ensure this (Heywood & Skoula,1999).

The Palestine diverse topography has permitted the survival of traditional knowledge related to vegetable resources used by locals as food. The consumption of plant gathered from the wild in the West Bank is thought to represent an important part of human nutrition. (Ali-Shtayeh *et al*., 2002; Said *et al*., 2002; Azaizeh *et al*., 2002; Ali- Shtayeh and Jamous, 2006).

In Palestine (West Bank and Gaza), about 2780 plant taxa were recorded as native or naturalized. From the native taxa, 162 taxa were recorded as endemics (Ali-Shtayeh *et al*., 2008).

1.4 Antioxidant activities of wild edible plants:

The degenerative diseases associated with aging include cancer, cardiovascular disease, immune-system decline, brain dysfunction and cataracts (Ames *et al*.,1993). They are also associated with free radicals because oxidative damage to DNA, proteins and other macromolecules accumulates with age and has been postulated to be a major type of endogenous damage leading to aging (Fraga *et al*., 1990 and Harman, 1981).

Edible plants are plants used in foods for eating, such as fruits, vegetables, and whole grains contain many components that are beneficial to human health (Varona, 2001). Research supports that some of these foods, as part of an overall healthful diet, have the potential to delay the onset of many age-related diseases. These observations have led to continuing research aimed at identifying specific bioactive components in foods, such as antioxidants, which may be responsible for improving and maintaining health (Knight, 2000). The relative levels of antioxidant activity and the total phenolic content extracts of a total of 51 plant species of Jordanian origin have been determined using, the total phenolic content of the investigated plant species ranged from 2.8 to 70.3 and from 2.6 to 59.6 mg GAE/g dry weight, respectively, while the total antioxidant capacity ranged from 12.9 to 731 and from 10.1 to 720 μmol TE/g dry weight, respectively (Tawaha *et al* ., 2007).

It has been used through the centuries as a remedy for many ailments from epilepsy to melancholy. Nowadays, it is prescribed by herbalists for intestinal worms, gastrointestinal ailments, bronchial problems, laryngitis, diarrhea, and lack of appetite (Leung & Foster, 1996). It has antiseptic properties, and can be used as a mouthwash, skin cleanser, anti-fungal agent for athlete's foot and as an anti-parasitic for lice, scabies, and crabs (Leung & Foster, 1996).

In Palestinian national dish, it is common to have herbs mixed together, such as roasted wheat and garbanzo beans, It is grounded into a

fine powder. Olive oil with thyme (za'ater) accompanied with fresh green vegetables are usually eaten for breakfast, it forms part of the staple diet in the Palestinian household (Muhawi & Kanaana, 1989).

Antioxidants are present in foods as vitamins, minerals, carotenoids, and polyphenols, among others. Many antioxidants are often identified in food by their distinctive colors—the deep red of cherries and of tomatoes; the orange of carrots; the yellow of corn, mangos, and saffron; and the blue-purple of blueberries, blackberries, and grapes (Halliwell & Gutteridge 1999).

The most well-known components of food with antioxidant activities are vitamins A, C, and E; β-carotene; the mineral selenium; and more recently, the compound lycopene (Halliwell & Gutteridge,1999).

Oxidation is essential to many living organisms for the production of energy to fuel biological processes. However, the uncontrolled production of oxygen derived free radicals is involved in the onset of many diseases such as cancer, rheumatoid arthritis, and atherosclerosis as well as in degenerative processes associated with aging (Halliwell & Gutteridge, 1999).

Almost all organisms are well protected against free radical damage by enzymes such as superoxide dismutase and catalase, or compounds such as ascorbic acid, tocopherols and glutathione (Mau *et al*., 2004).

Antioxidants have been widely used as food preservatives to protect them from oxidative degradation by free radicals; also they are used since ancient times to improve food flavours such as different types of spices which are known for their antioxidant capacities (Lee *et al*., 1999).

Free radicals, like reactive oxygen species (ROS), nitrogen and chlorine, are normal by products of metabolism and they are introduced into the body from outside sources of harmful chemicals in the environment, unhealthy food,stress, certain drugs, cigarette smoke ,etc. Increasing the intake of antioxidants can neutralize free radicals and protect body from the cell damage (Ranjbar *et al*., 2006).

Molecular oxygen is easily converted to reactive free radicals called "oxygen free radicals" (OFR) *in vivo* (Nakahara &Trakootivakorn, 2002). ORFs are formed by the transfer of one electron to the oxygen molecule during various physiological processes such as respiration chain, oxygenase reactions and cellular immunization reaction. OFRs damage the cell membrane, cytosolic molecules and genes, and they are associated with the incidence of various chronic diseases, i.e. heart diseases, thrombosis, hypertension and cancer (Nakahara & Trakootivakorn, 2002). It has been suggested that the ingestion of dietary antioxidants that suppress the ORF production or scavenge OFRs It has been suggested that the ingestion of dietary antioxidants that suppress the OFR production or scavenge ORFs may prevent harmful effect of OFRs. Some phytochemicals, i.e. flavonoids, pigments and antioxidative vitamins are known to be potent antioxidants (Nakahara & Trakoontivakorn, 2002).

In the body, oxidative stress results from the imbalance between the extent of ROS formation and the antioxidant defense mechanisms (Ranjbar *et al*.,2006). Links between oxidative stress and adverse health effects have been suggested for several groups of diseases, including cardiovascular, respiratory and neurological as well as for the general aging process. Such adverse effects are mediated by free radical damage to lipids, proteins and DNA. Protection from damage occurs through the action of multiple antioxidants (Ranjbar *et al*., 2006).

Different studies showed that flavonoids and phenolics are important for human (Blasco *et al*.,2004). They may help provide protection against different diseases by contributing, along with antioxidant vitamins and enzymes, to the total antioxidant defense system of the human body (Donald & Miranda, 2000). Although this research was focused on the chemical and volatile composition of the thyme, no information is available about its antioxidant activities in literature. Therefore, the aim of the present work is to evaluate the antioxidant potential of the *Majorana syriaca* ethanol extract.

1.5 Objectives of the study

The objectives of the current research are:

1- The documentation of indigenous ethnobotanical knowledge related to uses of wild edible plant species in the northern West Bank. This will be used to identify and evaluate the socio-economic and anthropological context in which these plants have been gathered and processed.

2- The identification of native and naturalized plants of the northern Palestinian West Bank, according to use categories such as food and medicines, food additives, and bee plants.

3- Preliminary evaluation of the conservation status and potential utilization in agriculture of these plants as alternative minor crops.

4-To examine the antioxidant activity of *Majorana syriaca* using DPPH and β-carotene assays

CHAPTER TWO

MATERIALS AND METHODS

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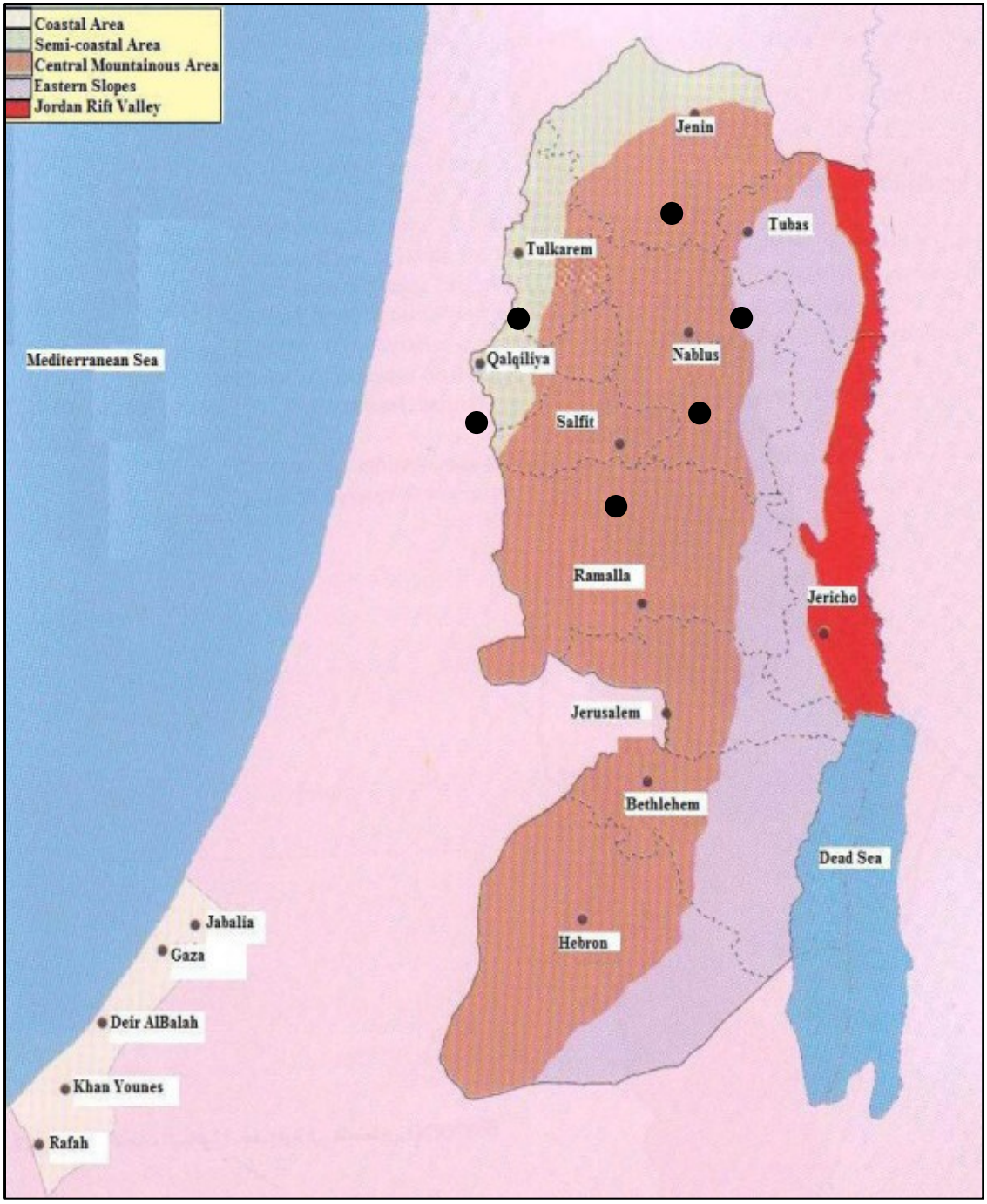
2.1 Study Area

This study has been carried out at the north part of the West Bank which is located at 32` 13` --35` 16` (Fig.2.1). The West Bank is divided into four major agroecological zones: semi coastal zone, central highlands, eastern slopes, and the Jordan Rift Valley. The area is characterized by mild climate where the annual temperature is around 25 to 30° C in summer and 5 to 15° C in winter. The annual rain fall is around 500 to 700 mm. The study area is characterized by various geographical regions including mountain, hill, and valley, therefore, there is a high diversity of vegetation (Issac & Gasteyer, 2000).

The studied sites were mainly located in the first three of the above-mentioned zones. The Semi-coastal and central highlands zones represent more than 60 per cent of total area of the West Bank. The central high lands are considered the largest ecoregion in the West Bank. It is mainly mountainous region with a good average rainfall ranging between 300 – 600 mm. It is classified as a Mediterranean zone. It includes natural forests and Evergreen oak Maquis forest. The main plant species that prevail are *Pinus halepensis, Cupresus semipervirens, Qurecus caliprinos, Ceratonia siliqua, Pistachia palaestina and Pistachia lentiscus*. Cultivated fruit trees were also available (**Appendix A**). In addition to the above plant species several other species including *Sarcopoterium spinosum, Cistus creticus, Phlomis viscosa and Thymus capitatus* prevailed. The semicostal region

consists mainly of flat areas extending from Jenin in the north as an extension of Marej Ben Amar to Tulkarem in its western part. It is characterized by deep, fertile soil with an average rainfall of about 500 mm. This area is mainly cultivated with vegetables and citrus. On the other hand, The Eastern slopes is a semiarid region, with steep mountains with little rainfall, this area is therefore suitable mainly for grazing with many annual and perennial herbs including *poa bulbosa, Sarcopoterium spinosum, Asphodelus aestivus, Ergngium certicum, Stipa capensis, Anthemis palestina Reut, Notobasis syriaca , Sinapis arvensis, Cichorium* spp , *Bromus syriacus, Centaurea procuuens* and several other secondary species. Natural forest area is also present in this region that consists of open Pseudo-savana type forests with sparse large trees mainly of *Certonia siliqua* and small shrubs like including *Pistachia lentiscus, Rhamnus palestinus*. Other species are also prevails including *Zizphus lotus* and *Retama raetam* (Issac & Gasteyer, 2000).

In this study, the traditional knowledge of wild edible plants was compared in 6 districts at the northern West Bank including: Nablus, Tulkarm, Qalqiliya, Jenin, Salfit, and Tubas. (Fig 2.1). Thirty nine villages distributed in the six districts were survied. The ecological and economic characteristics of the studied localities are listed (Appendix A).



Figure(2.1): West Bank map showing the locations of the study area.

2.2 Study population

Interviews were conducted during spring and summer of 2007, with approximately 15-69 informants in each district (total number of interviewees: 128 females, 87 males), (Fig.2.2) **(Appendix B)**. The inhabitants in this region have depended primarily on agriculture for long

time ago; therefore, old people of these areas still preserve the traditional knowledge on wild edible plants. Informants with a sound traditional knowledge of useful wild plants, mostly either native born or had been living in the region for more than 30 years, were interviewed. Informants were over sixty years old. However, no special selection criteria were used to choose informants.

The study started from 10/2/007 to 10/8/2007. Field work was conducted in 39 villages. Two hundred and fifteen informants of different age group: 69 from Nablus, 51 from Jenin, 37 from Tulkarm, 15 from Salfit,25 from Qalqiliya, and 18 from Tubas (Fig 2.1 & Appendix A).

Most of the interviewers were from families with a strong agricultural back ground. Descriptive questions, for random interviews and key informants were all used in data collection.

The process of collecting, preserving, storing, and preparing plants were carried out through photographing plants and video recording.

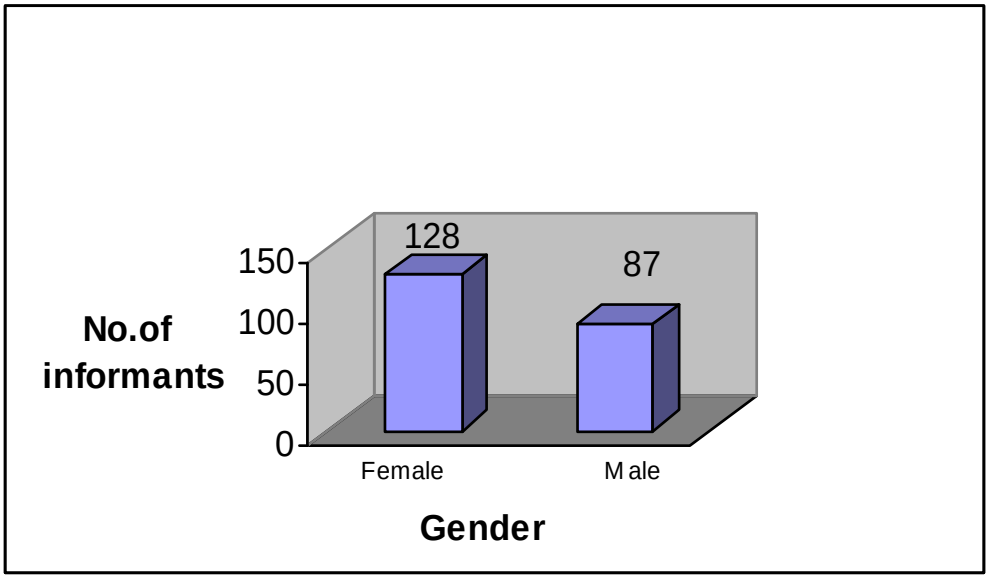


Figure (2 .2): Distribution of study population by gender.

Interviews were conducted with informants of different educational levels. Figure 2.3 shows the level of education, (Illiterate, primary, secondary, diploma, university).

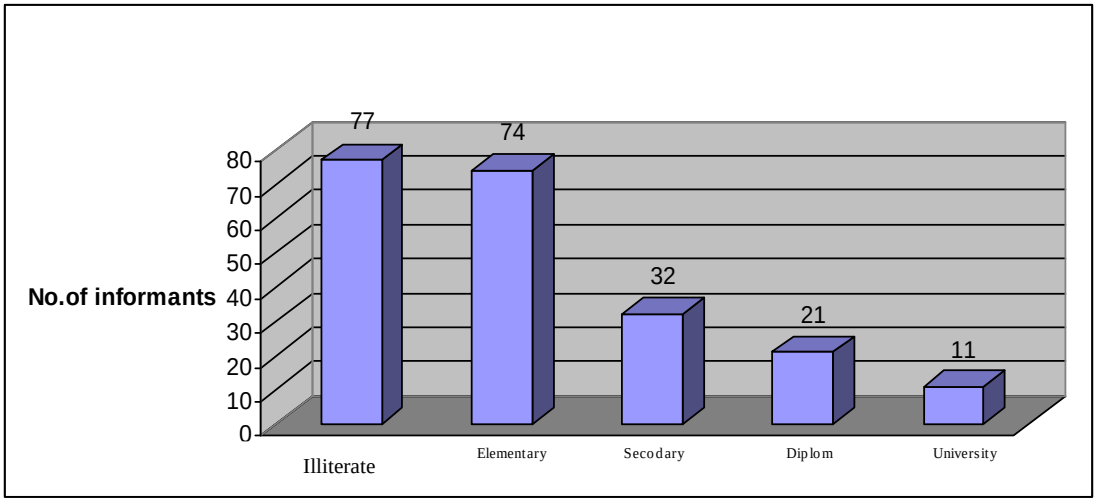


Figure (2.3): Distribution of study population by educational level.

2.3 Ethnobotanical methods

Ethnobotanical information was obtained through informed semi-structured questionnaire **(Appendix C).** The questions focused primarily on the local name for the plant, knowledge of the use of plants in the past and present, consumption way, how to get plants, the most important threats facing these plants, knowledge on the growing season, production and conservation. Data on the use of different species were collected through informed consent semi structured interviews with local informants. Most of the quantitative approaches were used to document the relative importance of each species and to indicate differences in selection criteria for consuming wild food species in the studied regions.

2.4 Categories of wild edible plants based on folk perceptions

In this study use categories were divided on the basis of folk perceptions into vegetables, fruits, herbal tea, food decoration and seasoning. also, the term "wild" refers to non cultivated plants gathered in the field (Ali-Shtayeh *et al*., 2008).

2.5 Threats to wild edible plants

To understand local peoples' perception on activities threatening wild edible plants, a number of threatening factors were identified with the community. These factors were presented to informants to select the important ones.(Table 3.5). Then the scores from each respondent summed up, the ranks determined and the factor that received the highest total score ranked first (Balemie &Kebebew, 2006).

2.6 Estimation of cultural significance of each species (cultural important index, CI).

The cultural importance index (CI) of each species was estimated for each locality as the summation of the use–report (UR) in every use – category mentioned for a species in the locality divided by the total number of survey participants (N) in that locality (Pardo *et al.*, 2007).

$$CI = \sum_{i=1}^{i=NU} \frac{UR_i}{N}$$

The additive index takes into account the spread of use (number of informants) for each species and its diversity of food uses. The theoretical

maximum value of the index is the total number of different food use categories. A mean cultural importance index (mCI) was used to evaluate wild food plant uses in the Northern West Bank under study, as a whole. It was calculated by considering all localities,

2.7 Estimation of cultural importance of families, CIF

To measure the cultural importance of plant families (CIF), the CIS of the species from each family were added (Galeano, 2000).

2.8 Antioxidant activities of *Majorana syriaca*

2.8.1 Extraction

Leaves and stems of *Majorana syriaca* were collected during summer 2007 from BERC- Botanic Gardens, Til- Nablus. The samples were then dried for 10 days in the shade at room temperature. Seventy five grams of grounded plant were then extracted with 750 ml of ethanol with stirring for 24 h. The extract was filtered through Whatman No. 4 filter paper and then with Whatman no.1. The ethanolic extract was then rotary evaporated at 75^{o}C to dryness, and stored at 4^{o}C for further use.

2.8.2 Chemicals

β-carotene, linoleic acid, 1,1-Diphenly-2-picrylhydrazyl (DPPH), buthylated hydroxytoluene (BHT), buthylated hydroxyanisol (BHA) and _-tocopherol were purchased from Sigma (Sigma, Aldrich GmbH, Sternheim, Germany). Pyrocatechole, Tween-20, folinciocalteu's phenol

reagent (FCR), sodium carbonate, ethanol, chloroform and the other chemicals and reagents were purchased from Merck (Darmstat, Germany). All other chemicals and reagents were of analytical grade.

2.8.3 DPPH assay

The hydrogen atom or electron donation abilities of the corresponding extract was measured from the bleaching of the purple-colored methanol solution of 1, 1-Diphenly-2-picrylhydrazyl (DPPH). This spectrophotometric assay uses the stable radical DPPH as a reagent (Burits & Bucar, 2000).

Briefly: 1 ml of various concentrations of the ethanolic extract was added to 4 ml of 0.004% methanol solution of DPPH. After a 30 min incubation period at room temperature, the absorbance was read against a blank at 517 nm using spectrophotometer (Spectro 23. 110 Volt, 60 hz). Inhibition of free radical by DPPH in percent (I %) was calculated in the following way:

$$I\ (\%) = (A_{blank} - A_{sample} / A_{blank}) \times 100$$

Where A_{blank} is the absorbance of the control reaction (containing all reagents except the test compound), and A_{sample} is the absorbance of the test extract. Extract concentration providing 50% inhibition (IC50) was calculated from the plot of inhibition (%) against extract concentration. Tests were carried out in triplicate.

2.8.4 β-Carotene-linoleic acid assay

In this assay, antioxidant capacity was determined by measuring the inhibition of the volatile organic compounds and the conjugated diene hydro peroxides arising from linoleic acid oxidation (Dapkevicius *et al*., 1998).

A stock solution of β-carotene-linoleic acid mixture was prepared as follows: 0.5 mg β -carotene was dissolved in 1 ml of chloroform (HPLC grade) and 25 μl linoleic acid and 200 mg Tween 40 were added. Chloroform was completely evaporated using a vacuum evaporator.

Then, 100 ml distilled water saturated with oxygen was added with vigorous shaking at a rate of 100 rpm for 30 min. Four ml of this reaction mixture were dispensed into test tubes and 200 μl portions of the extracts, prepared at 2 mg/l concentrations, were added and the emulsion system was incubated for 2 h at 50^{o}C.

The same procedure was repeated with synthetic antioxidant, BHT, BHA and α-tocopherol as positive control as well as a blank. After this incubation period, absorbencies of the mixtures were measured at 490 nm.

Antioxidative capacities of the extracts were compared with those of BHA, -tocopherol and blank. In order to further specify the source of the antioxidant of Thyme, both total phenolic compounds and the flavinoid concentration were determined.

2.8.5 Determination of total phenolic compounds

Total soluble phenolics in the ethanolic extract was determined with Folin-Ciocalteu reagent according to the method of Slinkard (Slinkard & Singleton, 1977) using pyrocatechol as a standard.

Briefly, 1 ml from extract solution (2000 ppm) was transferred into a volumetric flask of 50 ml, and made up to 46 ml with distilled water.

Folin-Ciocalteu reagent (1 ml) was added and the contents of flask were mixed thoroughly.

After 3 min, 3 ml of Na2CO3 (2%) was added, then the mixture was allowed to stand for 2 h with intermittent shaking. The absorbance was measured at 760 nm.

The concentration of total phenolic compounds in the ethanolic extracts determined as microgram of pyrocatechol equivalent by using an equation that was obtained from standard pyrocatechol graph is given as:

Absorbance = 0.00246 μg pyrocatechol + 0.00325 (R2: 0.9996) (Turkoglu *et al*., 2009).

2.8.6 Determination of total flavonoid concentration

Total flavonoid concentration was determined as follows: thyme ethanolic extracts solution (1 ml) was diluted with 4.3 ml of 80% aqueous ethanol and to the test tubes were added 0.1 ml of 10% aluminum nitrate and 0.1 ml of 1 M aqueous potassium acetate. After 40 min at room

temperature, the absorbance was determined spectrophotometrically at 415 nm.

Total flavonoid concentration was calculated using quercetin as standard (Park *et al*., 1997).

Absorbance = 0.002108 μg quercetin – 0.01089 (R2: 0.9999)

CHAPTER THREE

RESULTS

CHAPTER THREE
RESULTS

3.1 Taxonomic diversity of plants

The flora of the studied area is rich and provides diverse useful species. The study documented 58 wild edible plant species belonging to 22 families and 55 genera and forty nine of these plants were mentioned by 3 informants and above and were distributed across 46 genera and 20 families. Plants numbers that were mentioned by one or two informants (17 species), are presented in Appendix E.

Table (3.1): Number of species cited in the study areas by three informants or above, their genera, and families (total numbers of taxa recorded).

	Nablus	Jenin	Qalqilia	Salfit	Tulkarm	Tubas	Total
No. of Families	13 (15)	12(15)	12(18)	10(11)	14(15)	15(16)	20(22)
No. of Genera	27(33)	26(32)	18(32)	22(25)	25(34)	28(30)	46(55)
No. of Species	28(34)	28(34)	19(33)	24(29)	27(36)	30(32)	49(58)

3.2 Plant parts used and modes of consumption

Within the edible plants, leaves (66%) and foliage (15%) are the plant parts most widely used. Stems and inflorescence parts follow with 7% and 5% respectively (Figure 3.1).

Table (3.2): Comparison of the five plants most often cited (Scientific name (number of citations)) in each of the two regions.

Area	First plant	Second plant	Third plant	Foruth plant	Fifth plant
*Palestine	Majorana syriaca (150)	Salvia fruticosa. (131)	Malva sylvestris (129)	Cyclamen persicum (99)	Gundelia tournefortii. (99)
* *North Palestine	Majorana syriaca (146)	Malva neglecta (92)	Cyclamen persicum (60)	Salvia fruticosa . (50)	Gundelia tournefortii. (42)

*:Ali- Shtayeh et al., 2008.**:Current study.

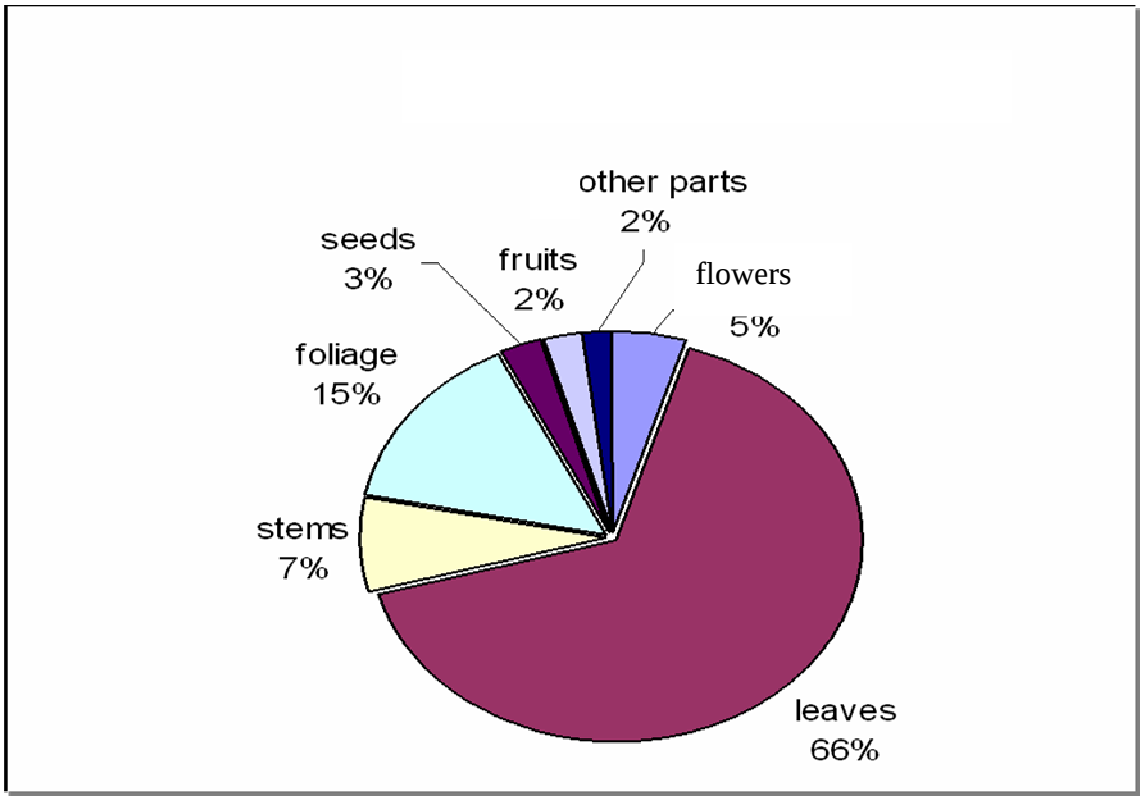


Figure. (3.1): Plant parts most widely used in the Northern West Bank

3.3 Plants Preservation Methods

A number of plants (28 %) are gathered and preserved to be stored and consumed on longer periods of the year (sometimes all year round, e.g.,*Majorana syriaca*. The most common ways of preserving plants

include air drying and then storing in suitable containers (e.g., glass containers), refrigeration, and freezing...(Fig 3.2) .

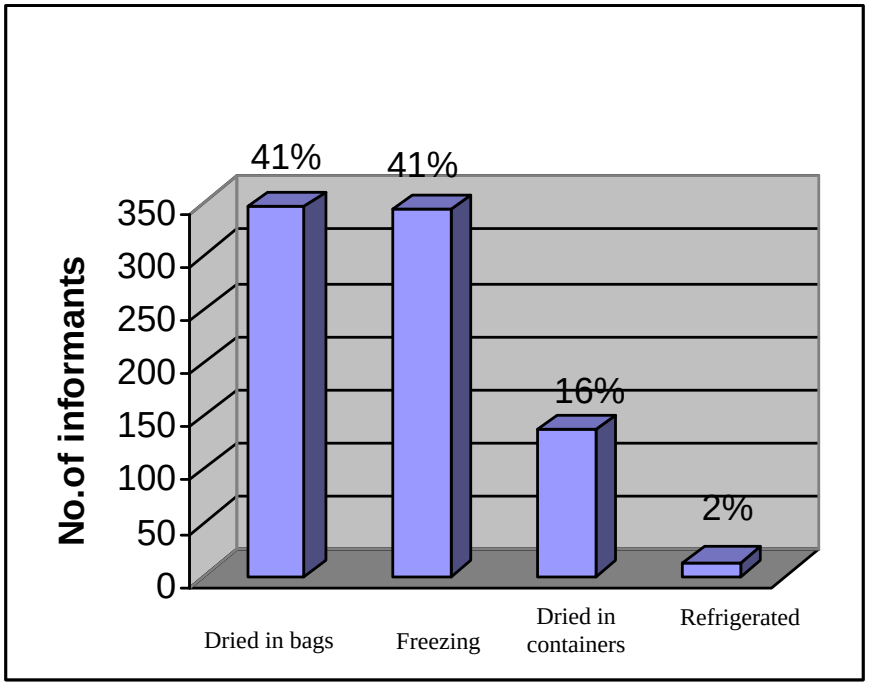


Figure. (3.2) Plants preservation methods.

Table (3.3) Ways of preservation of plants.

Latin name	**Common name**	**Arabic Name**	**No. Info**	**Storage type**	**Ways of preserved plants**
Agaricus Bisporus	Mushroom	مشروم	4	Freezing	Boil leaves in water for 10 minutes and then settle and placed in bags in the freezer.
Amygdalus communis	Almond	لوز بري		Dried, in glass container	Leaves are sundried for 5 days and then kept in glass.
Anisum vulgare	Anise	يانسون	6	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
			3	Dried, in glass	Leaves are sundried for 5 days and then kept in glass.
Arum palaestinun	Spotted arum	لوف	47	Freezing	Leaves put boiling water for 15 minutes and then settled and placed inside bags and frozen in the fridge

Latin name	**Common name**	**Arabic Name**	**No. Info**	**Storage type**	**Ways of preserved plants**
Asparagus aphyllus	Prickly Asparagus	هليون	2	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
Centaurea dumulosa	Shrubby Centaury	مرار	2	Freezing	Leaves boiling water for 20 minutes and then settles and placed inside bags of frozen in the fridge.
Ceratonia siliqua	Caroob	خروب	1	Dried, in bags	Leaves are sundried for one week and then kept in bags.
Coridothymus capitatus	Capitate thyme	زعتـــــر فارسي	8	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
			4	Dried, in glass	Leaves are sundried for 3 - 4 days and then kept in glass.
Cyclamen persicum	Cyclamen	زعمطوط	1	Dried, in bags	Leaves are sundried for 5 days and then kept in bags.
			11	Freezing	Boil leaves in water for 20 minutes and then settled and placed in bags in the freezer
			2	Dried, in glass	Leaves are sundried for 5 days and then kept in glass
			1	store in refrigerator	Wash the Leaves and then settled and kept in the fridge
Foeniculum vulgare	Sweet fennel	شومر	3	Dried, in bags	Leaves are sundried for 3-4 days and then kept in bags.
			1	Dried, in glass	Leaves are sundried for 5 days and then kept in glass.
Gageachlorantha	Gagea	زعيتمان	16	Dried in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
			3	store in Refrigerated	Wash the Leaves and then settled well and kept in the fridge.
Gundelia *tournefortii*	Gundelia	عكوب	96	Freezing	Leaves boiled in water for 20 minutes and then settled and placed in bags in the freezer.
Laurus nobilis	Laurel, Sweet bay	غار	3	Dried, in bags	Leaves are sundried in the sun for 3-4 days and then kept in bags.
Majorana syriaca	Wild thyme, mother of thyme	زعتـــــر بري	151	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
			132	Freezing	Leaves boiled in water for 15 minutes and then settled and placed in bags in the freezer.
			49	Dried, in glass	Leaves are sundried in the sun for 3 - 4 days and then kept in glass.

Latin name	**Common name**	**Arabic Name**	**No. Info**	**Storage type**	**Ways of preserved plants**
Malva sylvestris	common mallow	خبيزة	6	Dried, in bags	Leaves are sundried in the sun for 3 - 4 days and then kept in bags.
			8	Freezing	Leaves boiled in water for 15 minutes and then settled and placed in bags in the freezer.
			2	Dried, in glass container	Leaves are sundried for 3 - 4 days and then kept in glass container.
			3	Refrigerated	Wash the Leaves and then settled well and kept in the fridge.
Mentha longifolia	Horse Mint	نعنع	5	Dried, in bags	Leaves are sundried for 2 days and then kept in bags.
Mentha spicita	Mint	نعنع بري	9	Dried, in glass container	Leaves are sundried for 2 days and then kept in glass.
			9	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
Micromeria fruticosa	Thyme	زعتـــــر بلاط	5	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags
			2	Dried, in glass	Leaves are sundried for 3 - 4 days and then kept in glass.
Nasturtium officinale	Watercress	حويرنة	1	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
Nigella ciliaris	Nigella, black cumin	حبـــــــة البركة	3	Dried, in bags	Leaves are sundried for many days and then kept in bags.
			2	Dried, in glass	Leaves are sundried for many days and then kept in glass.
Oxalis pes-caprae	Wood Sorrel	حمصيص		Dried, in glass container	Leaves are sundried for 3 - 4 days and then kept in glass container.
Portulaca oleracea	Purslane	بقلة	1	Dried, in bags	Leaves are sundried for 3-4 days and then kept in bags.
Prunus mahaleb	Mahleb Cherry	محلب	1	Dried, in bags	Leaves are sundried for many days and then kept in bags.
Rhus coriaria	Sumach	سماق	1	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
			6	Dried, in glass	Leaves are sundried for many days and then kept in glass.

Latin name	**Common name**	**Arabic Name**	**No. Info**	**Storage type**	**Ways of preserved plants**
Rumex patientia	Patience Dock	سلق	1	Dried, in bags	Leaves are dried in the sun for 3 - 4 days and then keep in bags.
			15	Freezing	Leaves boiled in water for 15 minutes and then settled and placed in bags in freezer.
			1	Dried, in glass	Leaves are sundried for 5 days and then kept in glass.
Salvia fruticosa	White sage, Common sage, garden sage	ميرمية	24	Dried, in glass	Leaves are sunndried for 3 - 4 days and then keep in glass.
			44	Dried, in bags	Leaves are sundried for 3 - 4 days and then kept in bags.
Salvia hierosolymitana	Jerusalem sage	لسينة	31	Freezing	Leaves boiled in water for 20 minutes and then settled and placed in bags in freezer.
Sinapis arvensis	Wild Mustard	خردل	4	Dried, in bags	Leaves are sundried for 3 - 4 days and then keep in bags.
Taraxacum officinale	Dendelion	هندباء	10	Freezing	Leaves boiled in water for 15 minutes and then settled and placed in bags in freezer.
Trigonella foenum-graecum	Fenugreek seed	حلبة	19	Dried, in bags	Seeds are sundried for a week and then saved in plastic bags.
			12	Dried, in glass	Seeds are sundried for a week and then saved in glass container.

3.4 Most cited plants

Based on the study survey, it was found that there were many plants that are used in food in the six studied regions. The following plants were most widely used: *Majorana syriaca, Malva sylvestris Salvia hierosolymitana, Cyclamen persicum , Gundelia tournefortii, Coridothymus capitatus, Mentha spicata, Cichorium pumilumjacq,*

Teucrium polium and *Arum palaestinun*. The main stable food used in all regions was thyme (Table.3.4)

Table (3.4) Comparison of the five plants most often quoted (scientific name (number of citations) in each of six districts

Districts	First plant	Second plant	Third plant	Fourth plant	Fifth plant
Nablus	*Majorana syriaca* (41)	*Malva sylvestris* (30)	Salvia hierosolymitana.(27)	*Cyclamen persicum* (22)	Gundelia *tournefortii* (20)
Qalqiliya	*Salvia fruticosa* (17)	*Majorana syriaca* (14)	*Coridothyms capitatus* (7)	*Mentha spicata* (7)	*Malva sylvestris* (5)
Jenin	*Majorana syriaca* (51)	*Salvia fruticosa* (26)	*Malva sylvestris* (19)	Cichorium pumilumjacq. (10)	*Cyclamen persicum* (9)
Tulkarm	*Majorana syriaca* (36)	Cyclamen persicum (23)	*Malva sylvestris* (20)	Gundelia *tournefortii* (16)	*Cichorium pumilumjacq* (6)
Tubas	*Majorana syriaca* (18)	*Teucrium polium* (11)	*Malva sylvestris* (10)	*Arum palaestinun* (10)	*Salvia fruticosa* (7)
Salfit	*Majorana syriaca* (12)	*Malva sylvestris* (8)	*Arum palaestinun* (8)	*Gundelia tournefortii* (6)	*Cyclamen persicum* (6)

3.5 Threats and conservation status

It was found from the survey that there are many threats facing wild edible plants in their habitat. These threats resulted mainly as of human activities. The level of impacts of these activities varied from location to location. Among these activities were: insecticides, agricultural land expansion, fuel wood collection, over–grazing, over harvesting and uncontrolled fire setting. The number of informants listed each factor is shown in Table 3.5.

Table (3.5): Results of the ranking of factors considered as threats to wild edible plants.

Factors	N	J	Tul	Q	T	S	Total	Rank
Insecticides	*25	17	27	19	4	15	107	1
Agricultural land expansion	38	19	7	5	7	0	76	2
Fuel wood collection	26	12	4	2	14	4	62	3
Over- grazing	12	15	5	4	0	0	36	4
Over-harvesting	7	12	3	1	0	0	23	5
Uncontrolled Fire setting	1	0	0	0	0	0	1	6

N; Nablus, J; Jenin, Tul; Tulkarm , Q; Qalqilia, T;Tubas, S; Salfit

***:no. of informants**

This study revealed that 65% of the wild edible plant species were gathered from natural shrub lands followed by agricultural fields (24%), natural forests (8%) and roadsides (3%) (Fig.3.3).

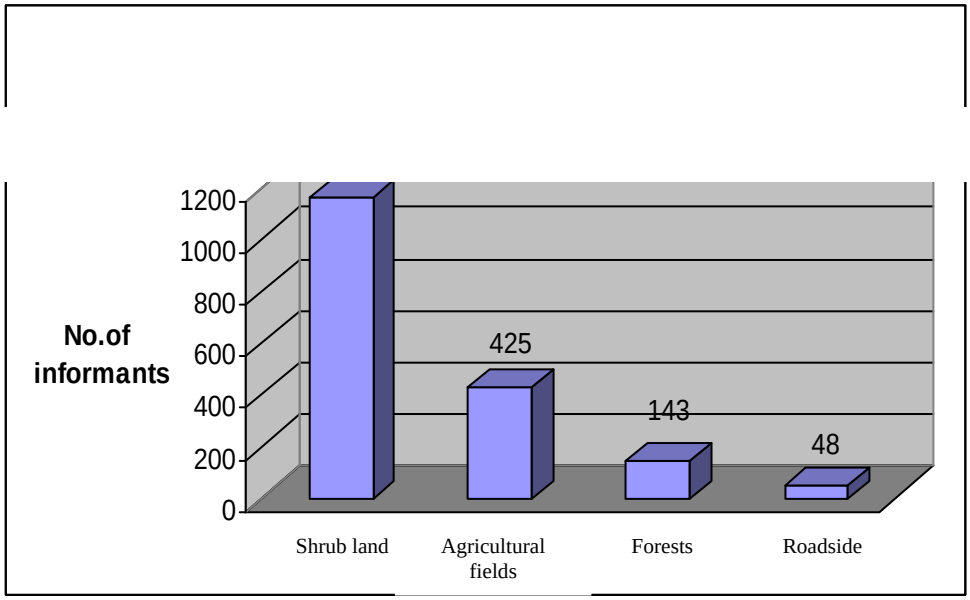


Figure. (3.3): Wild edible plants collection *habitats*.

3.6 Species cultural importance

The cultural importance index (CI) of the 58 relevant species in the surveyed area is shown in Table 3.6. There were big differences among the CI of the 58 species obtained in the different localities. It indicated that *Majorana syriaca* ranked number one with a mCI value of 1.96; it was reported in all 6 areas, with a maximum CI value in Salfeet (2.67).

Another group of species have mCI values ranging between 0.50-0.90 this includes:*Arum palaestinum, Centaurea dumulosa, Cichorium pumilumjacq, Gageachl orantha, Gundelia tournefortii,* and *Malva sylvestris Matricaria aurea, Rumex acetosa, Rumex Patientia, Salvia fruticosa, Salvia hierosolymitana, Teucrium polium.*

The other listed plant species have an mCI between 0.1 -0.5 including :(*Agaricus Bisporus, Asparagus aphyllus, Coriandrum sativum, Coridothymus capitatus, Crataegus aronia, Eruca sativa, Foeniculum officinale, Lactuca saligna, Mentha Longifolia, Micromeria fruticosa, Nasturtium officinale, Portulaca oleracea, Rumex Patientia, Scorzonera papposa, Silybum marianum, Sinapis arvensis, Tetragonolobus palaestinus, Trigonella foenum, Urtica pilulifera, Ziziphus spina-christi).*

The remaining plant species have a small mCI less than 0.5. (Table 3.6).

Table (3.6) Cultural importance index (CI) of 58 most relevant species in the study area in descending order by mean value

Latin name	Common name	J	N	S	T	Tul	Q	mCI
Agaricus bisporus	Mushroom	0.31	0.07	0.67	0.56	0.08	0.04	0.2883
Allium erdelli	Garlic	0	0	0	0	0	0.04	0.0067
Amygdalus communis	Almond	0	0	0	0	0	0.08	0.0133
Anchusa strigosa	Prickly Alkanet	0	0	0	0	0.04		0.008
Anisum vulgare	Anise	0	0.04	0	0	0	0.44	0.08
Arum palaestinum	Spotted arum	0.96	1.04	1.07	1	1.35	0	0.9033
Asparagus aphyllus	Prickly Asparagus	0.06	0	0	0.44	0.14	0	0.1067
Centaurea dumulosa	Shrubby Centaury	0.33	0.22	1	1	0.38	0.12	0.5083
Ceratonia siliqua	*Carob*	0	0	0.07	0	0	0.08	0.025
Chrysanthemum coronarium	Corn Marigold	0	.	0	0	0.02	0	0.004
Cichorium pumilumjacq	Dwarf Chicory	0.75	0.72	0.73	0.5	0.73	0.4	0.6383
Coriandrum sativum	Coriander	0	.	0	0.38			0.1267
Coridothymus capitatus	Capitate thyme	0.16	0.09	0	1	0	1.36	0.435
Crataegus aronia	Spiny Hawthorn	0	0.07	0.27	0.1	0.16	0	0.1
Eminium soiculatum	Friars cow	0	0.14	0				0.0467
Eruca sativa	Garden rocket	0.35	0.13	0.27	0	0.43	0.24	0.2367
Eryngium creticum	Snake Root	0.06	0	0	0.28	0.04	0.04	0.07
Ficus sycomorus.	Sycamore	0	0.3	0	0	0	0	0.05
Foeniculum officinale	Sweet fennel	0.29	0.35	0	0	0.11	0.68	0.2383
Gageachl orantha	Gagea	0.33	0.35	0.6	1.5	0.27	0.88	0.655
Gundelia tournefortii	Gundelia	0.55	0.62	0.87	1	0.89	0.56	0.784
Lactuca saligna	Wild lettuce	0.08	0.04	0.47	0.61	0.04	0.12	0.2267

Latin name	Common name	J	N	S	T	Tul	Q	mCI
Laurus nobilis	Laurel, Sweet bay	0	0	0		0.08		0.02
Lathyrus blepharicarpus gorgonei	_____	0	.	0.13	.		0.04	0.0567
Majorana syriaca	Wild thyme, mother of thyme	0.8	1.84	2.67	2	1.86	2.64	1.9683
Malva sylvestris	Common mallow	0.88	1.1	0.4	1	1.05	1.16	0.9317
Matricaria aurea	Golden cotula	0.47	0.35	0.13	2	0.32		0.654
Mentha Longifolia	Horse Mint	0	0	0.47	0.05	0.35	0	0.145
Micromeria fruticosa	Thyme	0.39	0.09	0.13	0	0	0.44	0.175
Morus alba	White Mulberry	0	0.01	0	0	0	0	0.0017
Nasturtium officinale	Watercress	0.14	0.01	1	0.27	0.02		0.288
Nigella sativa	*Nigella*	0.06	0	0	0	0	0.44	0.08
Oxalis pes-caprae	Wood Sorrel	0	.	0	0.3			0.05
Paronychia argentea	Silvery whitlowwart	0.02	0.03	0				0.008
Portulaca oleracea	Purslane	0.04	.	0.07	0.5	0.49	0.28	0.23
Prunus mahaleb	Mahaleb Cherry	0	0	0	0	0	0.08	0.0133
Psoralea bituminosa	_____	0.24	.	0	0	0	0	0.04
Punica granatum	Pomegranate	0	0	0	0	0	0.04	0.0067
Pyrus communis	Pear	0	0.12	0		0.02		0.035
Rhus coriaria	Sumach	0.06	0.04	0			0.08	0.045
Rosmarinus officinalis	Rosemary	0.04	.	0	0.27			0.0775
Rumex acetosa	Sorrel	0.45	0	0.8	1	0.68	0.4	0.555
Rumex Patientia	Patience Dock	0.24	0.12	0.47	1	0.216		0.4092

Latin name	Common name	J	N	S	T	Tul	Q	mCI
Salvia fruticosa	White sage, Common sage, garden sage	1.2	0.38	1.33	0	0.46	0.6	0.66
Salvia hierosolymitana	Jerusalem Sage	0.49	0.87	1	1	0.86	0.92	0.8567
Scorzonera papposa	Oriental Viper's Grass	0	0.07	0.8	0.05		0.08	0.2
Silybum marianum	Holy Thistle , Milky Thistle	0.59	0.04	0.4	0.56	0.27	0.08	0.3233
Sinapis arvensis	Wild Mustard	0.39	0.19	0.2	1	0.33	0.08	0.365
Tetragonolobus palaestinus	Purple Winged-Pea	0.02	0.06	0.2	0.39	0.02	0	0.115
Teucrium polium	Cat thyme	1.71	0	0	1	0.32		0.5
Tordylium aegyptiacum	Egyptian Hartwort	.	0		0.3			0.05
Trigonella foenum	Fenugreek seed	0.31	0.1	0.47	0	0.32	0.88	.38
Urtica pilulifera	Roman Nettle	0.33	0.06	0.6	0.56	0.216	0.04	0.3467
Ziziphus spina-christi	Christs Thornjujube, Nabak	0	0	0	0.16	0	0.28	0.301

N; Nablus, J; Jenin, Tul; Tulkarm , Q; Qalqilia, T;Tubas, S; Salfit

According to the mCI value, the 10 most culturally important species in the studied area is listed in table 3.7. Wild thyme *Majorana syriaca* shows the high mCI value follwed by *Malva sylvestris, Arum Palestinian, Salvia hierosolymitana , Gageachlorantha* and *Matricaria aurea* have an mCI values range from 0.937 to 0.654. *Trigonella foenum-graecum* has the lowest mCI value, some of these species were not reported as wild edible plant in certain survey areas, among these species is *Teucrium polium* which was not reported in both Nablus and Qalqiliya areas.

All the 10 species with the highest mCI were cited in all 6 areas except *Arum palaestinun* and *Matricaria aurea* and *Coridothymus capitatus* which were not reported at Qalqiliya and Tulkarm respectively.

Table (3.7): Cultural importance index (CI) of the 10 most relevant Species in the study area in descending order by mean value (mCI).

Common name	Latin Name	J	N	S	T	Tul	Q	mCI
Wild thyme, mother of thyme	*Majorana syriaca*	0.8	1.84	2.67	2	1.86	2.64	1.9683
Common mallow	*Malva sylvestris*	0.88	1.1	0.4	1	1.05	1.16	0.9317
Spotted arum	*Arum palaestinum*	0.96	1.04	1.07	1	1.35		0.9033
Jerusalem Sage	*Salvia fruticosa*	0.49	0.87	1	1	0.86	0.92	0.8567
Gagea	*Gageachlor antha*	0.33	0.35	0.6	1.5	0.27	0.88	0.655
Golden cotula	*Matricaria aurea*	0.47	0.35	0.13	2	0.32		0.654
Sorrel	*Rumex acetosa*	0.45	.	0.8	1	0.68	0.4	0.555
Cat thyme	*Teucrium polium*	1.71	.	0	1	0.32		0.5
Capitate thyme	*Coridothym us capitatus*	0.16	0.09	0	1		1.36	0.435
Fenugreek seed	*Trigonella foenum*	0.31	0.1	0.47		0.32	0.88	.38

N; Nablus, J; Jenin, Tul; Tulkarm , Q; Qalqilia, T;Tubas, S; Salfit

3.7 Cultural importance of the families

Table 3.8 shows the cultural importance of the most important families reported in each area. Labiatae was the most important family (8 species; mCIF, 4.953). Other important families include Asteraceae (10 species; mCIF 3.19). Polygonaceae has (3 species ;CIF 1.64), Araceae (2 species ;mCIF.926). Primulaceae (one species; mCIF 0.92) Papilionaceae (7 species ;mCIF 0.61) and Brassicaceae with (3 species; mCIF 0.81).

Table (3.8): Cultural importance of some of the most importance families in each of the surveyed areas, in descending order of the mean estimated for the whole North West Bank.

Family	No.of Species	J	N	S	T	Tul	Q	mCIF
Labiaetae	8	5.07	3.27	6	5.27	4.04	5.96	4.953
Compositae (Asteraceae)	10	2.77	2.07	4.53	5.72	2.69	1.36	3.19
Polygonaceae	3	1.57	1.22	0.59	3	1.95	1.56	1.64
Araceae	2	0.96	1.18	1.07	1	1.35	0	.926
Primulaceae	1	0.67	0.86	1	1	1.02	0.96	.92
Cruciferae (Brassicaceae)	3	0.88	0.33	1.29	1.27	0.78	0.32	.81
Liliaceae	3	0.39	0.36	0.19	1.94	0.41	0.92	.7
Leguminosae (Papilionaceae)	7	0.57	0.16	1.15	0.44	0.34	1	.61
Umbelliferae (Apiaceae)	5	0.35	0.39	0	0.69	0.15	1.16	.45
Urticaceae	1	0.33	0.06	0.6	0.56	0.22	0.04	.3
Portulacaceae	1	0.04	0	0.07	0.5	0.49	0.28	.23
Rosaceae	4	0	0.19	0.27	0.1	0.18	0.16	.15
Moraceae	2	0	0.31	0	0	0	0	.05
Ranunculaceae	1	0.06	0	0	0	0	0.44	.08
Rahamnaceae	1	0	0	0	0.16	0	0.28	.07
Anacardiaceae	1	0.06	0.04	0	0	0	0.08	.03
Oxalidaceae	1	0	0	0	0.3	0	0	.05
Tricholomataceae	1	0.31	0.07	0.67	0.56	0.08	0.04	.28
Lauraceae	1	0	0	0	0	0.08	0	.01
Caryophyllaceae	1	0.02	0.03	0	0	0	0	.008
Punicaceae	1	0	0	0	0	0	0.04	.006

Table 3.9 shows the number and percentages of species (% spp) of use report (UR) among each food category at each survey site. Vegetable was the most important category in all areas with 47.7% UR followed by fruits (19.3%UR), this percentage was similar to the UR% of seasoning (18.2%), however, both food decoration and herbal tea had the lowest UR% (8.2% and 6.6%) respectively.

Table (3.9): Number and percentage of wild edible plants of use report (UR) among food categories at the survey sites

Food category	N		J		Q		Tul		T		S		**Total**	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Vegetables	396	(66.6%)	438	(84.1%)	228	(69.3%)	363	(82%)	303	(80%)	194	(81.9%)	354	(47.7%)
Food decoration	78	(13%)	0	0	1	(.3%)	37	(8.3%)	0	0	0	0	61	(8.2%)
Herbal tea	15	(2.5%)	20	(3.8%)	24	(7.3%)	11	(2.5%)	27	(6.9%)	9	(3.8%)	49	(6.6%)
Seasoning	45	(7.6%)	52	(10%)	50	(15.2%)	21	(4.6%)	43	(11%)	19	(8%)	135	(18.2%)
Fruits	61	(10.3%)	11	(2.1%)	26	(7.9%)	11	(2.5%)	16	(4%)	15	(6.3%)	143	(19.3%)
Total no. of nformants	595		521		329		443		389		237		742	

N. Nablus ; Q , Qalqilia ; S , Salfit ; T, Tubas ; Tul , Tulkarm ; J , Jenin

3.8 Species selection and availability

Table 3.10 shows the regional selection index for each food-category and the total value for each region. Significant differences appear in the total values of the RSI. The higest RSI value was obtained in Nablus (39) followed by Qalqiliya and Tulkarm (38, 37) respectively. However lower RSI values were obtained in the other locations .

Table (3.10): Regional Selection Index for each food-category

Food category	**Nablus**		**Jenin**		**Qalqiliya**		**Tulkarm**		**Tubas**		**Salfit**		**Mean**	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Vegetables	19	(50%)	23	(70%)	21	(35%)	25	(68%)	22	(69%)	18	(58%)	32	(46%)
Food decoration	2	(5%)	1	(3%)	1	(2%)	1	(2%)	0	0%	0	0%	4	(6%)
Herbal tea	4	(10%)	2	(6%)	4	(11%)	3	(8%)	2	(6%)	2	(6%)	7	(10%)
Seasoning	6	(15%)	4	(12%)	7	(18%)	4	(11%)	4	(13%)	4	(13%)	11	(16%)
Fruits	8	(20%)	3	(9%)	5	(13%)	4	(11%)	4	(13%)	7	(23%)	15	(22%)
Total RSI	39		33		38		37		32		31		69	

3.9 Antioxidant activities

Antioxidant activity of *Majorana syriaca*

The ethanolic extract of *Majorana syriaca* was subjected to screening for its possible antioxidant activity, depending on DPPH free radical scavenging and β-carotene / linoleic acid assays. Total phenolic compounds, and total flavonoid concentrations were measured and used for the analysis.

1,1-Diphenly-2-picrylhydrazyl (DPPH), a stable free radical with a characteristic absorption at 517 nm, was used to study the radical scavenging effects of the extracts. As antioxidant donates protons to these radicals, the absorption decreases. The decrease in absorption is taken as a measure of the extent of radical scavenging. Free radical scavenging capacities of the extracts, measured by DPPH assay, are shown in Table3.11 and Figure 3.4.

Table (3.11) Percent inhibition of thyme compared with synthetic antioxidants at different concentration

	%Inhibition			
Concentration µg/ml	***Majorana syriaca***	**Tocopherol**	**Buthylated hydroxytoluene BHT**	**Buthylated hydroxyanisol BHA**
60	27	54	15	37
80	35	74	33	62
100	46	86	42	67
200	53	91	52	73
400	63	92	62	78
600	71	93	73	81
800	78	95	85	86
1000	82	97	91	89

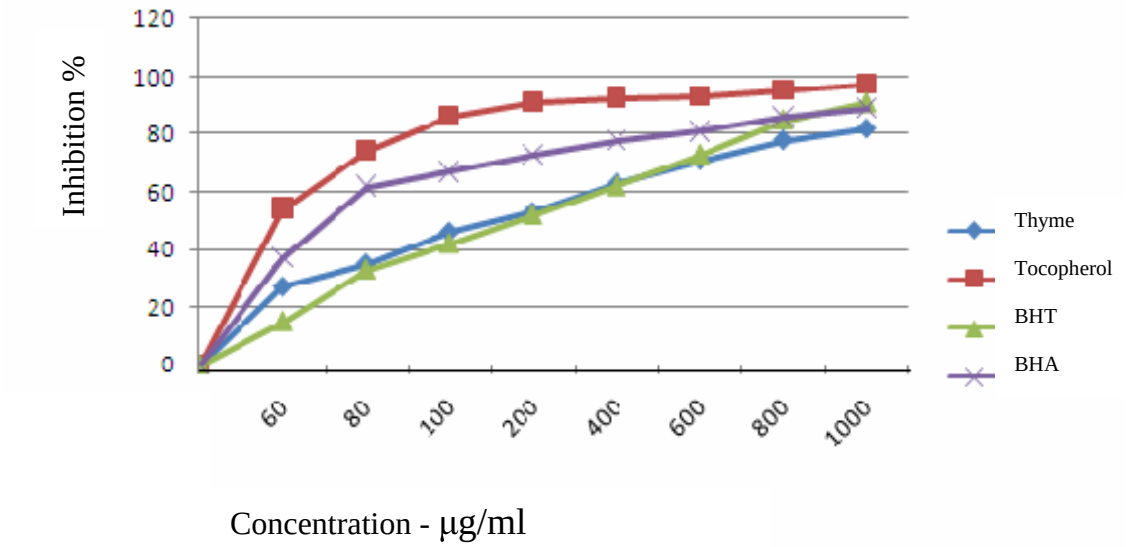


Figure (3.4) Percent inhibition of thyme compared with synthetic antioxidants at different concentration

The 50% of inhibition value of thyme extract seems to be fairly high when compared to commonly used synthetic antioxidant BHA and α-Tocopherol (IC50 = 38 µg/ml) ethanolic extract was necessary to obtain 50% of DPPH degradation. 100 µg/ml of ethanol thyme extract has an equivalent inhibition value of 60 µg/ml BHA (Table3.12 and Figure 3.5).

Table (3.12) free radical scavinging capacities (Ic50)of thyme ethanolic extract measured in DPPH.

Ic50	***Majorana syriaca***	**Tocopherol**	**BHT**	**BHA**
Conc. µg/ml	100	38	125	60

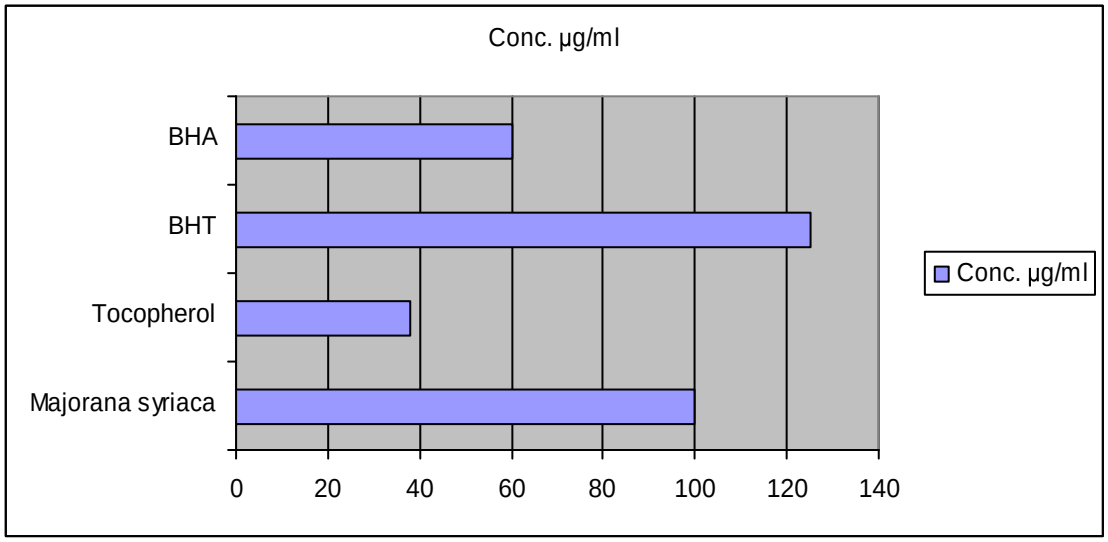


Figure (3.5): free radical scavinging capacities of thyme ethanolic extract measured in DPPH.

The result of the antioxidant activity of thyme plant detected by B-Carotene –Linoleic acid is shown in Table 3.13.

Table (3.13): β-Carotene assay

	Absorbance		
Time(minute)	**Thyme plant**	**Tocopherol**	**Water**
0	1.1	1.1	1.1
15	0.999	1.09	0.974
30	0.946	0.983	0.851
45	0.943	0.92	0.76
60	0.93	0.88	0.693
75	0.915	0.845	0.647
90	0.91	0.816	0.624
105	0.892	0.788	0.576
120	0.892	0.767	0.536

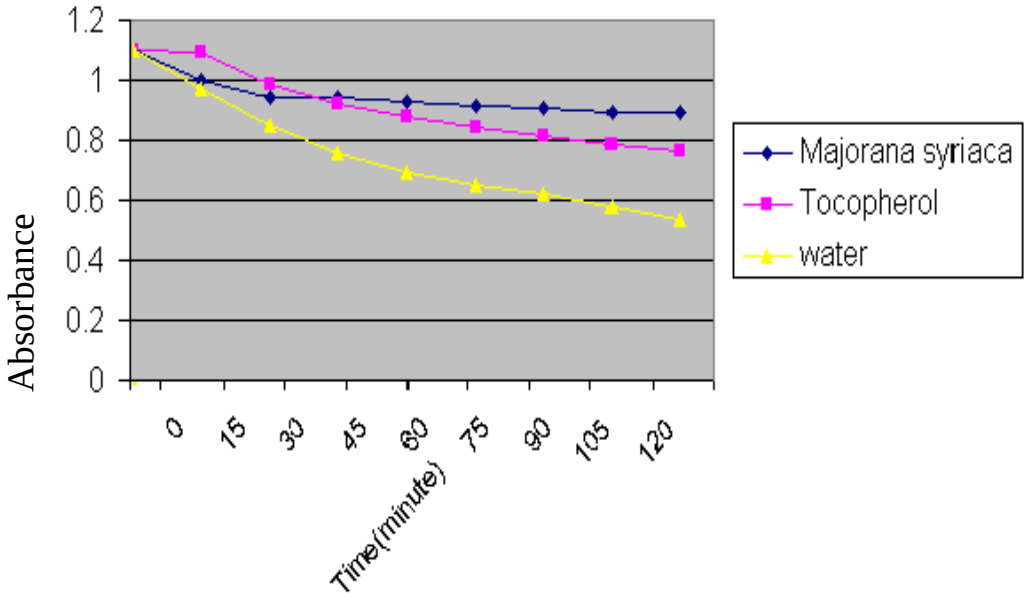


Figure (3.6) Absorbance of plant extracts using β-Carotene assay

Total phenolic compound amount was calculated as quite high in thyme ethanolic extract (37.3µg mg-1 pyrocatechol equivalent). In addition , the total flavonoids compound was calculated to be 146µg mg-1 quercetin equivalent.(Table 3.14).

Table (3. 14) Total phenolic compounds using Pyrocatechole

Concentration-µg /ml	Absorbance
0.025	0.065
0.05	0.126
0.075	0.188
0.1	0.247
0.125	0.311
0.15	0.372
0.2	0.499

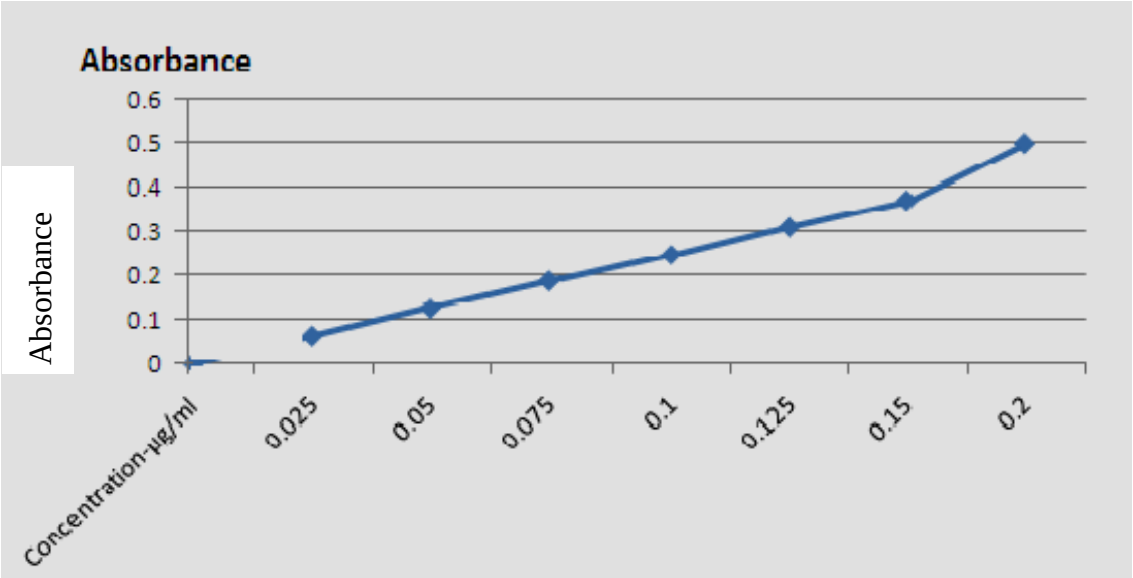


Fig. (3.7): Calibration curve for Pyrocatechole

Table (3.15): Concentration of phenolic compounds in thyme plant.

Name	Absorbance	Concentration µg /mg
Tocopherol	0.261	105.1
Thyme	0.094	37.3

Table (3.16): Total flavonids using quercetin

Concentration **µg** /ml	Absorbance
0.04	0.104
0.08	0.342
0.12	0.549
0.16	0.768
0.2	0.947
0.24	1.207
0.28	1.395

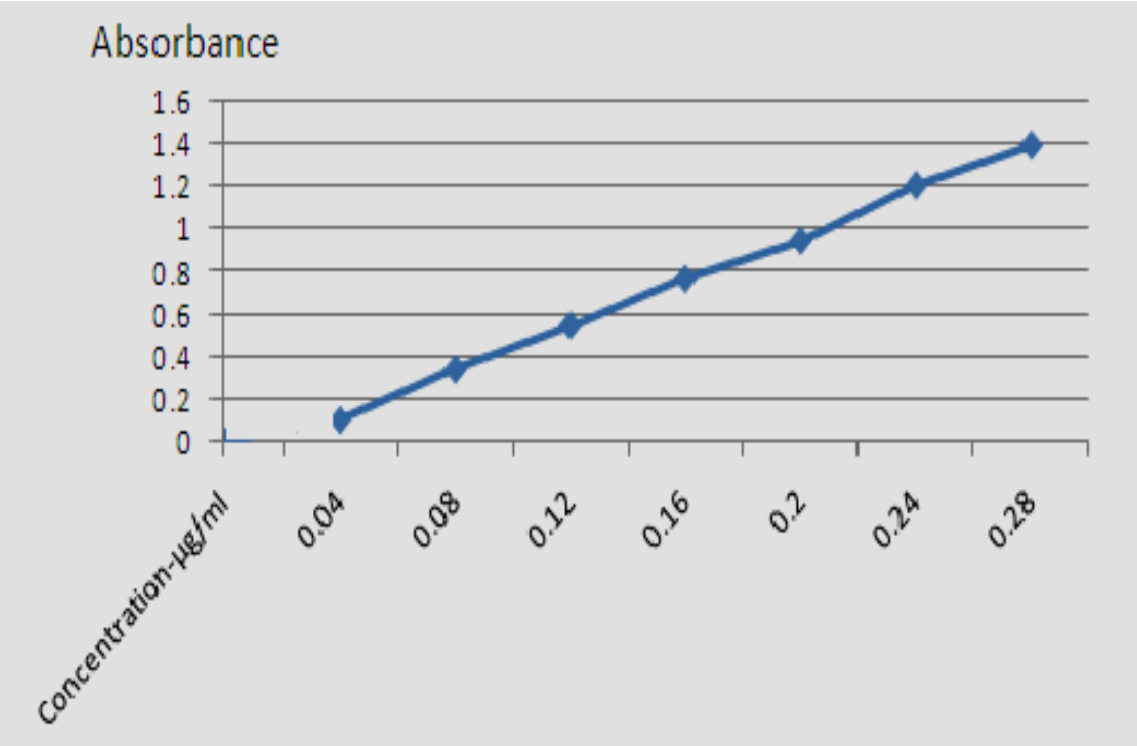


Fig. (3.8): Calibration curve for quercetin

Table (3.17): Concentration of flavonoid in thyme plant.

Name	Absorbance	Concentration-µg /mg-1
Tocopherol	0.054	28.4
Thyme	0.686	146.4

CHAPTER FOUR

DISSCUSSION

CHAPTER FOUR
DISSCUSSION

4.1 Study population

The current study shows that women were predominantly represented in the samples. Women in our society are more linked with food and food preparation; wild edible plants constitute a major part of rural meals. Most of the interviews were more than 50 years old. This is similar to the percent of aged people in rural communities.

4 .2 Taxonomic diversity

Despite the small studied area, the high number of plant species reflects high plant diversity. In this study 58 species belonging to 22 families were recorded. Such diversity is well known in the Mediterranean region, which is characterized by high humidity levels, moderate temperature, rain, and wind (Ali-Shtayeh & Hammad,1995). The findings of this study are consistent with those reported by Ali-Shtayeh and Jamous (2006).

4.3 Plant parts used and mode of consumption

The results of the study showed that most of the plant parts were consumed after cooking. The wild edible plants are consumed mainly in many different ways according to local traditions. They are mainly eaten raw or cooked and thus require different preparation processes.

The high percentage of cooked edibles may be attributed to the change of the socio-economic context of rural areas around the country. (Ali-Shtayeh *et al*., 2008).

Nowadays, people have no enough time to go outside and consume edible plants. They are highly used to consume cooked food, therefore, edible plants are collected from the wild and brought home for more elaborated cooking recipes (Ali-Shtayeh et al., 2008).

The study also showed that leaves were the most plant part consumed, followed by foliage and stem, according to several informants. Wild green leafy vegetables increase the amount of blood in the body which is likely to refer to the high iron content of many wild greens. (Misra *et al*., 2004).

4.4 Plants consumed cooked

Different methods of preparing cooked plants were adopted by the consumers; for instance, several plants such as "*Malva neglecta* " usually washed, cut and then mixed with onions and cooked with oil. for other plants, e.g. *Arum palaestinum*, leaves are cut, washed with salts, then fried with olive oil. In some plants, e. g *Trigonella foenum- graecum,* soaked seeds are boiled then pasted seeds are mixed with semolina, flour and sugar syrap.

A number of wild edible plants are used in traditional recipes. For example, the leaves of *Rumex acetosa* are used as filling for a traditional

pie called ‘sambosek, and *Majorana syriaca* is used for preparing a traditional recipe that is very popular in all Palestinian communities called ‘za’tar’. The leaves are dried, grinded, mixed with olive oil, sesame seeds, and several other condiments and spices. The mix is then eaten with olive oil and bread.

4.5 Plants consumed raw

On the other hand, most plants (23.4 %) with edible leaves, roots, or fruits are eaten raw. The majority of these plants are eaten fresh, directly after they are gathered. For example, *Majorana syriaca, Eruca sativa, Foeniculum vulgaris and Portulaca oleracea* are used in salads and dressed with olive oil and lemon or are eaten with pickled olives, onions and bread. The finding of this result is consistent with the reported result of Ali-Shtayeh *et al*. (2008).

4.6 Preserved plants

People using different ways to preserve plants and food for off season consumption and for longer period. In Palestinian rural society, the most common ways are drying in bags and placed inside sealed Bags. Among the most famous plants that use this preserving method is *Salvia fruticosa* Mill where the leaves air dried for several days under the sun and then kept inside sealed bags.

Other ways of preserving food are include refrigeration and freezing. The plants, e.g, *Gundelia tournefortii,* are first prepared either by boiling

in water or frying in oil. Other methods are also applied by people like drying and then stored inside glass utensils. These findings are similar to those reported by Ali-Shtayeh *et al*. (2008).

4.7 Most cited plant

Based on number of informants who mentioned the plant for food purposes at different localities, the following were the most utilized plants (cited by more than half of the maximum number of informants who reported a plant for any food use) in order: *Majorana syriaca*. *Malava neglegta*, *Cyclamen persicum* Miller, *Salvia fruticosa*, and *Gundelia tournefortii* . (Table 3.5). This finding is similar to that of Hadjichambis *et al*., (2008) who listed the five most quoted species in each of seven Mediterranean countries studied, when these five plants were compared to our study it was clear that a great variability in the consumption existed among the different countries, however, when the finding of this study was compared to that of Ali- Shtaya *et al.* (2008). It was clear that the five most reported plants were the same in both studies, in addition a similar trend was observed in the distribution of the five species.(Table 3.2).

4.8 Threats and conservation status

Our results showed that ethnobotanical study are under serious threat. According to the world conservation union, over 8,000 plant species worldwide are threatened with extinction, and the number grows daily (Farnsworth, 2007). In Palestine and according to the red list of medicinal

plants in West Bank and Gaza more than 39% of the medicinal plants listed in the national list are threatened (Ali-Shtayeh & Jamous 2006). According to the red list (12 of spp) among the 59 species found in this study were threatened.

This is mainly attributed to excessive collection and other human activities including; over-grazing, agricultural land expansion, uncontrolled fire setting, fuel wood connection and pesticides usage. The contribution of each factor differs among the different localities. Therefore there is a need for several measures to protect these plants in their habitat. However, very few economic plant species (e.g., *Majorana syriaca* and *Gundelia tournefortii*) are now cultivated and marketed by some farmers.This shows that acquisition of economic benefits from species might promote local people's interest in conservation and maintenance of such locally important and threatened species (Ali -Shtayeh & Jamous, 2002).

4.9 Contribution of wild edible plants as food medicines

No clear dividing line between food and medicinal plants usually exists, especially in indigenous and local traditions. Food can be used as medicine and vice versa. Still certain wild edible plants are used because of their assumed health benefits and thus can be called medicinal foods (Etkin, 1994).

Among the 58 edible plants recorded, 34 have been cited as food and medicinal plants (Appendix C). These food plants have been recognized as

medicinal in the Traditional Arabic Palestinian Herbal Medicine (Ali-Shtayeh *et al*., 2008). These plants are reported in the Palestinian medicinal ethnoflora (Ali-Shtayeh *et al*., 2008).The intervention between food and medicine is well known in traditional societies, the Palestinian societies highly depend on using herbal plants as therapeutic treatment for several human diseases. However, many herbal medicinal plants are consumed as food. There is no clear dividing line between food and medicinal plants in both indigenous and local traditions. Food can be used as medicine and vice versa. Certain wild edible plants are still used because of their assumed health benefits, thus can be classified as medicinal foods, among these plants is *Allium erdelli* which consumed because it is perceived to protect from blood pressure (Etkin, 1994).

It is worth mentioning that previous ethnobotanical field surveys have revealed that healthcare practices of the household using preparations based on plants are usually administered by women. However, most studies have advantaged the 'medicine of healers' instead of the 'medicine of the households (Ali-Shtayeh *et al*.,2008).

Many of these plants are consumed as protective measures of certain diseases, for example, the leaves for *Arum palaestinun* is consumed fried using olive oil to protect from cancer. Labiatae; Liliaceae and Composite are the most frequently used families.

This study shows that many plant species relate to minor and major ailments, mainly for abdominal apparatus diseases (15 species), infections

(14), skin (9), chest pain and cough (8) , urinary system (6) and toothache (4) (Appendix C). The availability of these remedies provides a quick way of curing various minor complaints such as tooth-ache, belly and rheumatic pain and headaches and can also serve as first aid in cases of cicatrizing, lenitive, haemostatic agents etc.

4.10 Species of cultural importance

The values of the CI in this studies show that most plant species that attained a high value were used as food and medicine. These plants include some of the most dominant plants that are included in the Palestinian traditional culture and ethnobotany, namely *Majorana syriaca, Arum palaestinea,* Salvia *hierosolymitana* and *Matricaria aurea*. On the other hand, other species like, *Cyclamen persicum*, and *Gundelia tournefortii* have been used for a very long time to prepare traditional recipes (Crowfoot & Baldensperger, 1932).

The finding of this study was consistent to that mentioned by Ali-Shtayeh *et al*. (2008). Some of these plants are considered holy plants being mentioned in the holy books (e.g. *Majorana syriaca* in the bible), or sacred/blessed like *Salvia fruticosa* being mentioned in legends linked with holy people. Despite of the strong taste, some plants are used mainly for food and medicine in some communities an example is the *Arum palaestinian* (Carmen) used in the Palestinian communities to treat certain pains(Ali-Shtayeh *et al* , 2008).

A few of these plants are even mentioned in local folkloric songs and proverbs (*Gagea chlorantha*, *Coridothymus capitatus* , *Rumex acetosa* and *Matricaria aurea* (Crowfoot & Baldensperger, 1932) and Ali-Shtayeh *et al*., (2008). The differences in the CI at different location may be attributed to the fact that people do not consume all edible plants in their localities but only small part of these plants (Rivera *et al*., 2006).

4.11 Cultural important in the families

Regarding the diversity of species gathered, Asteraceae was the most important family, with 9 species being consumed as green vegetables. Other important families are Labiatae, with 7 species, used as respitory infusions, and Rosaceae, with 4 species being consumed as green vegetables or in infusions. Five species Consumption mainly involves eating ripe berries or making liqueurs and 2 species of Araceae occurred in many use categories. This result are in agreement with that of Ali-Shtayeh *et al*., (2008) who reported that *Asteraceae*, *Fabaceae* and *Lamiaceae* were more often quoted as wild edible followed by *Rosaceae*, *Brassicaceae* and *Apiaceae* in the Northern West Bank. In addition the finding of this study was consistent with that of Hadjichambis *et al*. (2008) who found that *Lamiaceae*, *Rosaceae*, and *Apiaceae* were among the five families with the greater number of representative wild edible plants in the Mediterranean countries. In addition, the study was confirmed with that of Pardo-de-Santayana *et al*., (2007) who reported that both *Rosaceae* and *Asteraceae* were the largest and most diverse in Spain. The results showed

that the quoted plants were plants that are close and easy accessible. These results are also in agreement with those of Bonet *et al*. (1999), Johns *et al*. (1990) and Stepp and Moerman (2001) who found similar important of the families studied..

4.12 Species selection and availability

The relation between species availability and consumption showed differences among the different locations. There are many possible explanations for such differences. Salfit and Tubas, for example, are small isolated regions, that are commonly thought to yield a greater traditional ecological knowledge. In addition, isolation is also associated with lack of information sharing with other regions. Similar conclusions were reached by Milliken & Albert (1997), who hypothesised that a high degree of human dispersion as a result of semi-nomadic migration could be responsible for vast knowledge of medicinal plants. Qalqilia and Tulkarem also show a high percentage of RSI, their mild climate due to proximity to the sea means that cultivating vegetables and fruit in allotments is more productive, and, consequently, fewer wild plants are needed. On the contrary, the low RSI for Nablus and Jenin indicate that a remarkable knowledge of wild edible plants is still employed. The explanation is mainly due to cultural reasons such as appreciation of seasoning, vegetables or herbal teas edible plants. The RSI for each food-category further helps to understand the observed differences. When the mean of the RSI for each of the categories was obtained, it was clear that species used

for their flowers were much less likely to be selected as edible than leaves or fruits (Pardo *et al*., 2007).

4.13 Antioxidant activities

The ethanolic extract of *Majorana syriaca* shows a high inhibition value of the DPPH and β-carotene / linoleic acid assays. 100 mg/ml of ethanol thyme extract has an equivalent inhibition value of 60 mg/ml BHA.

Thyme ethanolic extract competes favorably with α -Tocopherol in β-carotene-linoleic acid system used to determine the antioxidant capacity. The high inhibition value of thyme extract could be due to the high concentration of phenolic compounds. Phenols are important components of plants. The pro found antioxidant *Majorana syriaca* see to be attributed to both favonoids (Crockett *et al*., 2005 and Tawaha *et al*., 2007) and poluphenol compound that was detected in the extract (Tawaha *et al*., 2007). Found ahigh antioxidant activity of *Arbutus a*n*drachne* with high total phenolic content (57.6 mg GAE /g weight) (Tawaha *et al*., 2007). They were reported to eliminate radicals due to their hydroxyl groups (Hatano *et al*., 1989), and they contribute directly to antioxidant effect of system (Duh *et al*., 1999).

Total flavonoids compound was calculated to be 146μg mg-1 quercetin equivalent. Like phenol compounds, the contribution of flavonoids to antioxidant activity is known. It has been reported that BHT

I3 and hypericine which have the structure of flavonoid have a very high antioxidant effect.

4.14 Conclusion and Recommendations

A large number of edible wild plants (58) are still in use in the northern part of the West Bank. Fifty percent of these species are used for food and medicine. The most cited plants in the six districts are; *Majorana syriaca*, *Arum palaestinea* ,*Salvia hierosolymitana* , *Matricaria aurea*, *Cyclamen persicum*, and *Gundelia tournefortii* . These species are more abundant and accessible and culturally rooted in the area. This study indicates that the patterns of wild edible plant usage appear to depend mainly on socio-cultural factors rather than biological ones. The traditional knowledge (TK) of using and preserving these plants is still being transferred from generation to generation but seems to be aging. Medicine of household as apposed to medicine of the healers has proven to be an important source of TK associated with the use of medicinal plants. A high antioxidant activity was found in thyme plant *Majorana syriaca*. A total phenolic compound amount was found in thyme ethanolic extract (37.3µg mg-1 pyrocatechol equivalent). In addition, the total flavonoids compound was calculated to be 146µg mg-1 quercetin.

Recommendations

1. The need to apply conservation measures in the regions aiming at protecting endangered species and this can done through the establishment of reserved areas, societies, public awareness that encourage plant protection and maintenance of these wild plants.

2. The need for preserving knowledge through documentation and encouragement of people working in the field (extension).

3. Better communications and information exchange, as well as direct contact with nature in everyday life aspect is necessary to encourage the consumption of edible wild plants.

4. The need for identification of possible side effects of using and utilizing these wild plants to limit complications that might occur due to miss use of such plants.

5. The need for further investigation on these plants including bioassays of the important species.

6. As the study indicated the high potential of using wild edible plants for human benefits , therefore , it deserves further investigations.

References

References

Abdulrahaman, A. A., Fajemiroye, O. J., & Oladele, FA. (2006). ***Ethnobotanical Study of Economic Trees: Uses of Trees as Timbers and Fuel woods in Ilorin Emirate of Kwara State, Nigeria***. *Ethnobotanical Leaflets, 10: 113-120.*

Ali-Shtayeh, M.S., & Hammad, A.K.(1995). **Protection of the Palestinian Environment** .Nablus: Alhasoub Alarabi (Arabic).

Ali-Shtayeh, M. S., & Jamous, R. M.(2002). **"Red list of threatened plants" of the West Bank and Gaza Strip and the role of botanic gardens in their conservation**. *Biodiversity and Environmental Sciences Studies Serie*,**2**:1–46.

Ali-Shtayeh, M. S., & Jamous, R. M. (2006). **Ethnobotany of Palestinian herbal medicine in the Northern West Bank and Gaza Strip: Review and a comprehensive field study**. *Biodiversity and Environmental Science Studies Seriesy, 4:1-22.*

Ali-Shtayeh, M.S., Jamous, R.M., Al-Shafie', J., Elgharabah, W., Kherfan, F., Qarariah, K., Khdair, I., Soos, I., Musleh, A., Isa, B., Herzallah, H.,Khlaif, R., Aiash, S., Swaiti, G., Abuzahra, M., Haj-Ali, M., Saif,i N., Azem, H., & Nasrallah, H. (2008). **Traditional knowledge of wild edible plants used in Palestine**.Journal of Ethnobiology and Ethnomedicine, 4:13.

Ali-Shtayeh M. S., Yaniv, Z., & Mahajna, J. (2002).**Ethnobotanical survey in the Palestinian area: A classification of the healing potential of medicinal plants**. *Journal of Ethnopharmacolog,* **73**:221–232

Ames, B. M., Shigenaga, M. K & Hagen, T. M. (1993). **Oxidants, antioxidants, and the degenerative diseases of aging**, *Proc Natl Acad Sci U S A.* 1993 September 1; 90(17): 7915–7922.

Azaizeh, H., Fuder, S., Khalil, K., & Said, O. (2002). **Ethnobotanical survey of local practitioners of the Middle Eastern region: the status of traditional Arabic medicine**. *Fitoterapia*, 74, 98-108.

Balemie, K., & Kebebew, F. (2006). **Ethnobotanical study of wild edible plants in Derashe and Kucha Districts, South Ethiopia**. *Journal of Ethnobiology Ethnomedicin*e, 2:53)

Batal, M., & El-Fattal, L. (2006). **Promoting Dietary Diversity in Poor Communities of Lebanon** (*IDRC project No. 102692*).

Blasco, A.J., Gonzalez, M.J & Escarpa, A. (2004). **Electrochemical approach for discriminating and measuring predominant flavonoids and phenolic acids using differential pulse voltammetry: towards an electrochemical index of natural antioxidant**. *Anal. Chim. Acta.* 2004, *511*, 71-81.

Bonet, M., Parada, M., Selga, A.,& Vallès, J.(1999). **Studies on pharmaceutical ethnobotany in the regions of L' Alt Emporda'**

and Les Guilleries (Catalonia, Iberian Peninsula). *Journal of Ethnopharmacology*, 68:145-168.

Bruneton, J. (1995). **Pharmacognosy, Phytochemistry and Medicinal Plants**. *Intercept. Ltd. England, U.K.*

Burits, M., & Bucar, F. (2000). **Antioxidant activity of Nigella sativa essential Phytotheraphy Research**. 14: 323–328.

Crockett, S.L., Schaneberg, B., & Khan,I.A. (2005). Phytochemical profiling of new and old world Hypericum (St. John's Wort) species, *Phytochemical Analysis* **,** pp. 479–485.

Crowfoot, G.,& Baldensperger, L.(1932). **From cedar to hyssob: A study in the folklore of plants in Palestine London**. *Sheldon Press*.

Dapkevicius, A., Venskutonis ,R.,Van Beek, TA & Linssen, P.H. (1998). **Antioxidant activity of extracts obtained by different isolation procedures from some aromatic herbs grown in Lithuania**. *J. Sc.Food and Agric*. 77: 140-146.

Donald R., & Cristobal Miranda.(2000). **"Antioxidant Activities of Flavonoids**." Linus Pauling Institute. 2000. Accessed Online October 8, 2009.

Duh, P. D., Tu, Y.Y., & Yen, G. C. (1999). Antioxidant activity of water extract of harn jyur Chyrsanthemum morifolium Ramat). *Lebensmittel-Wissenschaft und Technologie* 32: 269–277

Etkin, N. (1994). **Eating on the Wild Site. The Pharmacologic, Ecologic and Social Implications of Using Noncultigens**. Tucson, AZ: University of Arizona Press.

Farnsworth, E. (2007). Conservation biology, wild life management and botany, in the encyclopedia of earth.

Fern, K.(1997). **Edible & Useful Plants For A Healthier World, Plants for a future.**

Fraga, C. G., Shigenaga, M. K., Park, J. W., Degan, P., & Ames, B.N. (1990).**Oxidative damage to DNA during aging: 8hydroxy-2'-deoxyguanosinein rat organ DNA and urine**. Proc. Natl. Acad. Sci. United States of America, 87:4533 4537.

Galeano, G.(2000). **Forest use at the Pacific coast of Choc , Colombia: A quantitative approach .***Economic Botany, **54:**358-376)*

Hadjichambis, A.C.H., Paraskeva-Hadjichambi, D., Della, A., Giusti, M., DE Pasquale, C., Lenzarini, C., Censorii, E., Gonzales-Tejero, M. R., Sanchez- Rojas, C. P., Ramiro-Gutierrez, J., Skoula, M., Johnson, C. H., Sarpakia, A., Hmomouchi, M., Jorhi, S., El-Demerdash, M., El-Zayat, M., & Pioroni, A. (2008). **Wild and semi-domesticated food plant consumption in seven circum-Mediterranean areas**.*International Journal of Food Sciences and Nutrition 2007,99999(1132[http://www.informaworld.com/10.1080/09637480701566495]Accessed 2008 Mar 29.*

Halliwell, B., & Gutteridge, J.(1999). **Free radicals in biology and medicine (3rd.)**. *Oxford: Oxford University Press*.

Harman, D.(1981). **The aging process**. *Proceedings of the National Academy of Sciences of the United States of America, 78, 7124-7128.*

Hatano, T., Edamatsu, R., Mori, A..,Fujita, Y.,&Yasuhara, E.(1989). **Effect of interaction of tannins with co-existing substances. VI. Effects of tannins and related polyphenols on superoxide anion radical and on DPPH radical.** *Chemical and Pharma.Bull. 7: 016-2021.*

Heywood, V., & Skoula, M. (1999). **The MEDUSA Network**: **Conservation and sustainable use of wild plants of the Mediterranean region.** *In: J. Janick (ed.), perspectives on new crops and new uses*. P 148-151. *Alexandria, VA: ASHS Press*.

Issac,J. & S. Gasteyer. (2000). **The Issue of Biodiversit in Palestine**. The Applied Research Institute – Jerusalem. *Palestine.*

Johns, T., Kokwaro,J. & Kimanani, E.K.(1990). **Herbal remedies of the Luo of Siaya District. Kenya: Establishing quantitative criteria for consensus**. *Economic Botony* 1990, 44:369-381.

Kallas,J.(1996).**Edible Wild Plants from Neighborhood to Wilderness: A Catalyst for Experiential Education**. In 1996 Association for Experiential Education 24th Annual International Conference Proceedings, Spokane, WA, September 26-29, 1996 pp. 140-144.

Knight, J.A. (2000). The biochemistry of aging. *Adv Clin Chem.*; 35:1-62.

Ladio,A., & Lozada M.(2004). Cultural Transmission of Ethnobotanical Knowledge in a Rural Community of Northwestern Patagonia, Argentina, *Human Ecology, Vol.32, No.2.*

Lee, S.., Yeo, W., Yun, B., & Yoo, D. (1999). **Isolation and sequence analysis of new peptaibol, boletusin, from Boletus spp**. *Journal of Peptide Science*, 5 (8): 374-378.

Leung, A.Y., & Foster, S. (1996). *Encyclopedia of Common Natural Ingredients Used in Food, Drugs, and Cosmetics.* New York: John Wiley & Sons, 1996, 492-5.

Mau,L., Chang, N., Huang, J., & Chen, C. (2004) **Antioxidant properties of methanolic extracts from Grifola frondosa, Morchella esculanta and Termitomyces albuminosus mycelia**. *Food Chem* 87: 111–118.].

Milliken, W., Albert, B.(1997).**The use of medicinal plants by the Yanomami indians of Brazil, Part II**. *Economic Botany* 1997,51:264–278.

Misra ,S.,Maikhuri,RK.,Kala,CP.,Rao.KS and Saxena, KG. (2004).**Wild leafy vegetables:A study of their subsistence dietetic support to the inhabitants of Nanda Devi Biosphere Reserve, India** , *Journal of ethno biology and ethno medicine* ,2004, 4:15

Muhawi., I., & Kanaana, S.(1989)**.** ***Speak, bird, speak again : Palestinian Arab folktales***, Berkeley, University of California Press.

Nakahara, K., Trakoontivakorn, G., Alzoreky, N.S., Ono, H., Onishi-Kameyama, M. and Yoshida, M.(2002). Antimutagenicity of some edible Thai plants, and a bioactive carbazole alkaloid, mahanine, isolated from *Micromelum minutum*. Journal of Agriculture and Food Chemistry 50: 4796-4802..

Pardo-de-Santayana M, Tard o J, Blanco E, Carvalho AM, Lastra J.J, San Miguel E and Morales R.(2007). **Traditional knowledge of wildedible plants used in the northwest of the Iberian Peninsula (Spain and Portugal): a comparative study**. *J Ethnobiol Ethnomed* 2007, 3:27

Park, Jae Kweon; Morita, Kenji; Fukumoto, Ikuo; Yamasaki, Yukikazu; Nakagawa, Tsuyoshi; KAWAMUKAI, Makoto and Matsuda, Hideyuki.(1997). **Purification and characterization of the Chitinase (ChiA) from Enterobacter sp**. *G-1*. *Bioscience Biotechnology and Biochemistry*, vol. 61, no. 4, p. 684-689

Ranjbar, A., Khorami, S., Safarabadi, M., Shahmoradi, A., Malekirad, Ali., Vakilian, K., Mandegary, A., & Abdollahi, M. (2006).. **Antioxidant Activity of Iranian Echium amoenum Fisch & C.A**. *Mey Flower Decoction in Humans: A cross-sectional Before/After Clinical Trial.*

Rivera, D., Obn, C., Heinrich, M., Inocencio, C., Verde, A., & Fajardo, J. (2006). **Gathered Mediterranean food plants ethnobotanical investigations and historical development**. In *Mediterranean food plants and nutraceuticals* Edited by: Heinrich M, Müller WE, Galli C. Basel:Forum of Nutrition, Basel Karger;18-74..

Said, O., Khalil, K., Fulder, S., & Azaizeh, H. (2002). **Ethnopharmacological survey of medicinal herbs in Israel, the Golan Heights and the West Bank region**. *Journal of Ethnopharmacology*, 83, 251-265.

Salmon, E. (1999). **Sharing Breath with Our Relatives: Rara´muri Plant Knowledge**, *Lexicon, and Cognition.*Ph.D. Dissertation, University of Michigan, Ann Arbor. 352 pp.

San Miguel, E.(2004). **Etnobotanica de Piloa̋ (Asturias). Cultura y saber popular sobre las plantas en un concejo del Centro- Oriente Asturiano**. In PhD thesis Universidad Autńoma de Madrid, Biology.

Slinkard, K., & Singleton, VL. (1977). ***Total phenol analyses: automation and comparison with manual methods. American J. Enolo. Viticul. 28:49–55.***

Sofowora, A. (1982). **Medicinal plants and traditional medicine in Africa** . *USA.: Willy and Sons, NY*.

Stepp, J.R., Moerman, D.E. (2001). **The importance of weeds in ethnopharmacology**. *Journal of Ethnopharmacology* 75:19-23.

Tawaha, Kh., Alil, F., Gharaibeh, M., Mohammad, M., & El- Elimat, T. (2007). **Antioxidant activity and total phenolic content of selected Jordanian plant species.** Journal of food chemistry, Volume 104, Issue 4, Pages 1372-1378.

Turkoglu, A., Mercan, N., Duru, M., Gezer, K., Kivrak, I., & Turkoglu, H. (2009). **Antioxidant and antimicrobial properties of ethanolic extract from Lepista nuda** , *Journal of Anal of Microbiology, 339-344***.**

Varona, V. (2001). **Nature's Cancer-Fighting Foods**, The Gale Encyclopedia of Diets - A Guide to Health and Nutrition_Part1 *New York: Penguin Putnam Inc.*

Vavilov, N.I. (1926). Studies on the origin of cultivated plants. Bulletin of Applied Botany,Genetics and Plant Breeding 16, 1-248.

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Appendices

Appendix A

Number of informants, localities visited and geographical features of each area.

Community Village code	Community /Village name	Region/ district	Ecological and economic characteristics of the community area	Number of informants
N1	Deir-alhatab	Nablus	Rural: agriculture(olive trees)	5
N2	Beitiba	Nablus	Rural: small scale agriculture, minor industrial activities	4
N3	Yaseed	Nablus	Mountainous/rural area : agriculture(olive trees)	6
N4	zeita-jammain	Nablus	Rural: agriculture(olive trees)	6
N5	Qusin	Nablus	Rural: agriculture(olive trees)	5
N6	Aseraalqeblya	Nablus	Rural: agriculture (almond, fig).	5
N7	Deir-sharaf	Nablus	Rural: agriculture(olive trees, Fig	5
N8	Rujeib	Nablus	Rural: agriculture(olive trees)	4
N9	Urif	Nablus	Rural: agriculture(olive trees)	4
N10	Sara	Nablus	Rural: agriculture(olive trees)	4
N11	Azmout	Nablus	Rural: agriculture(olive trees) Animal husbandry	4
N12	Burin	Nablus	Rural: agriculture (olive trees, Fig, almond).	6
N13	Salem	Nablus	Rural: agriculture (olive trees), cattle farm.	4
N14	Aqraba	Nablus	Rural: agriculture, Animal husbandry	7
J1	Yabad	Jenin	Rural: agriculture(olive trees)	10
J2	Araba	Jenin	Rural: agriculture (olive trees, almond and fruit trees).	6
J3	Arbona	Jenin	Rural: agriculture (Fruit trees, vegetables).	4
J4	Jalaboon	Jenin	Rural: agriculture(olive trees)	5
J5	Deerghazal	Jenin	Rural: agriculture (olive trees, Grain).	5
J6	Faqoa	Jenin	Rural: agriculture (olive trees, Grain).	5
J7	Brqeen	Jenin	Rural: agriculture (olive trees, Grain).	5

Community Village code	Community /Village name	Region/ district	Ecological and economic characteristics of the community area	Number of informants
J8	Kofordan	Jenin	Rural: agriculture (Grain and vegetables).	5
J9	Yammon	Jenin	Rural: agriculture(olive trees, Fig, almond	6
T1	Bala	Tulkarm	Mountainous/rural area : agriculture(olive trees)	5
T2	Koforroman	Tulkarm	Mountainous/rural area : agriculture(olive trees)	5
T3	Anabta	Tulkarm	Rural: agriculture(olive trees)	5
T4	Kofralabad	Tulkarm	Rural: agriculture(olive trees)	5
T5	Qafeen	Tulkarm	Rural: agriculture(olive trees)	5
T6	Al-Nazlah al-Wustta	Tulkarm	Rural: agriculture(olive trees)	5
T7	Beitleed	Tulkarm	Rural: agriculture(olive trees)	7
S1	Derrestya	SAlfit	Rural: agriculture(olive trees, Fig	7
S2	Kofraldeek	SAlfit	Rural: agriculture(olive trees)	8
Q1	Alfondoq	Qalqilia	Rural: agriculture(olive trees)	5
Q2	Haja	Qalqilia	Rural: agriculture(olive trees)	5
Q3	Azoon	Qalqilia	Rural: agriculture (olive trees, citrus).	5
Q4	Hablaeh	Qalqilia	Rural: agriculture (olive trees, citrus).	5
Q5	Nabilias	Qalqilia	Rural: semi coastal area: agriculture (olive trees, citrus, orchard, intensive agriculture).	5
T1	Tyaseer	Tubas	Rural: agriculture(olive trees)	9
T2	Alaqaba	Tubas	Rural: agriculture(olive trees)	9
				215

Appendix B
Study population
معلومات شخصية للمشاركين في دراسة النباتات البرية التي تؤكل في شمال الضفة الغربية.

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
					القرية	المحافظة		
1	عفاف محمد ابو حسن	اليامون	1957	انثى	اليامون	جنين	اساسي	ربة بيت
2	عادل محمد توفيق ابو حسن	اليامون	1957	ذكر	اليامون	جنين	اساسي	عامل
3	حلوة صالح فريحات	اليامون	1954	انثى	اليامون	جنين	امي	ربة بيت
4	سعيد احمد فريحات	اليامون	1949	ذكر	اليامون	جنين	اساسي	بلا عمل
5	زكية عبد اللطيف عبد الوهاب فريحات	اليامون	1947	انثى	اليامون	جنين	امي	ربة بيت
6	فتحي احمد عيد فريحات	اليامون	1949	ذكر	اليامون	جنين	اساسي	بلا عمل
7	خالد فيصل سمور	برقين	1957	ذكر	برقين	جنين	جامعي	دكتور
8	محمد صالح عبدالله سمور	برقين	1958	ذكر	برقين	جنين	دبلوم	موظف
9	نافع حسن سماره	برقين	1927	ذكر	برقين	جنين	امي	بلا عمل
10	خيرية محمود محمد صبح	برقين	1953	انثى	برقين	جنين	ثانوي	ربة بيت
11	صدقي صالح محمد صبح	برقين	1953	ذكر	برقين	جنين	دبلوم	موظف
12	حيدر ابو الرب	جلبون	1950	ذكر	جلبون	جنين	ثانوي	بلا عمل
13	محمد أحمد	جلبون	1955	ذكر	جلبون	جنين	ثانوي	عامل
14	خولة سباعنه	جلبون	1957	انثى	جلبون	جنين	جامعي	ربة بيت
15	حسين محمد القاسم	جلبون	1948	ذكر	جلبون	جنين	اساسي	بلا عمل
16	ختام محمد امين ابو الرب	جلبون	1957	انثى	جلبون	جنين	جامعي	موظفة
17	حنان احمد زكارنة	دير غزالة	1955	انثى	دير غزالة	جنين	ثانوي	ربة بيت
18	ختام توفيق غزال	دير غزالة	1953	انثى	دير غزالة	جنين	امي	ربة بيت
19	غسان احمد زكارنة	دير غزالة	1953	ذكر	دير غزالة	جنين	دبلوم	موظف
20	امنة عبد الرحيم ذيب زكارنة	قباطية	1955	انثى	دير غزالة	جنين	اساسي	ربة بيت
21	حمدي محمد كامل نزال	قباطية	1952	ذكر	دير غزالة	جنين	اساسي	بلا عمل
22	نايفة احمد محمد ابو الرب	المنسي	1928	انثى	عرابة	جنين	امي	ربة بيت
23	عبد العزيز محمد حسن ابو الرب	النزلة الوسطى	1956	ذكر	عرابة	جنين	اساسي	عامل
24	عبد الرحمن محمد حسن ابو الرب	باقة الشرقية	1950	ذكر	عرابة	جنين	دبلوم	موظف
25	اسمهان محمد حسن ابو الرب	باقة الشرقية	1955	انثى	عرابة	جنين	ثانوي	ربة بيت
26	روضة ابراهيم حج حسن	مركة	1945	انثى	عرابة	جنين	امي	ربة بيت
27	محمود محمد مصطفى عبد العزيز	مركة	1956	ذكر	عرابة	جنين	ثانوي	عامل
28	زهير امين اسعد بني حسن	عربونة	1954	ذكر	عربونة	جنين	جامعي	موظف
29	رجوة سعيد عيسى	عربونة	1952	انثى	عربونة	جنين	اساسي	ربة بيت
30	وفاء ياسر مصطفى	عربونة	1950	انثى	عربونة	جنين	ثانوي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
31	احمد صالح مصلح ابو حسن	عربونة	1941	ذكر	عربونة	جنين	ثانوي	بلا عمل
32	جهاد محمد تيسير احمد	فقوعة	1953	ذكر	فقوعة	جنين	ثانوي	تاجر
33	لطيفة محمود علي عباس	فقوعة	1950	انثى	فقوعة	جنين	ثانوي	ربة بيت
34	غادة محمود	فقوعة	1953	انثى	فقوعة	جنين	ثانوي	ربة بيت
35	فائدة طاهر	فقوعة	1951	انثى	فقوعة	جنين	ثانوي	ربة بيت
36	سميرة احمد ابو سلامة	فقوعة	1954	انثى	فقوعة	جنين	ثانوي	ربة بيت
37	امنة نايف محمد عابد	كفر دان	1952	انثى	كفر دان	جنين	اساسي	ربة بيت
38	نعمان احمد محمد عابد	كفر دان	1944	ذكر	كفر دان	جنين	اساسي	مزارع
39	لطيفة محمد رحال	كفر دان	1960	انثى	كفر دان	جنين	ثانوي	موظف
40	محمد علي رحال	كفر دان	1960	ذكر	كفر دان	جنين	ثانوي	موظف
41	مصطفى سعيد درويش	كفر دان	1935	ذكر	كفر دان	جنين	اساسي	مزارع
42	شمسة محمود زيد الكيلاني	يعبد	1937	انثى	يعبد	جنين	امي	ربة بيت
43	مهدية عبد الله عمارنة	بعارة	1942	انثى	يعبد	جنين	امي	ربة بيت
44	يوسف صادق عمارنة	يعبد	1937	ذكر	يعبد	جنين	اساسي	بلا عمل
45	حسن مصطفى حسن	يعبد	1950	انثى	يعبد	جنين	امي	ربة بيت
46	نجلاء عيد محمد شطور	يعبد	1950	انثى	يعبد	جنين	اساسي	ربة بيت
47	عادل عبد الناصر ابو بكر	يعبد	1940	ذكر	يعبد	جنين	اساسي	تاجر
48	قمر فهمي زيد الكيلاني	يعبد	1957	انثى	يعبد	جنين	ثانوي	ربة بيت
49	حسين يوسف صادق عمارنة	يعبد	1955	ذكر	يعبد	جنين	ثانوي	تاجر
50	فداء حسن محمود عمارنة	الكويت	1954	انثى	يعبد	جنين	جامعي	ربة بيت
51	نظمية ابراهيم خليل عمارنة	يعبد	1941	انثى	يعبد	جنين	دبلوم	متقاعدة
52	نصره عامر محمد	زيتا جماعين	1942	انثى	دير استيا	سلفيت	امي	ربة بيت
53	صالح محمد خفش	دير استيا	1955	ذكر	دير استيا	سلفيت	اساسي	بلا عمل
54	عبد الكريم احمد عبد الله	دير استيا	1933	ذكر	دير استيا	سلفيت	اساسي	بلا عمل
55	عزية ابراهيم ريان	قراوة بني حسان	1960	انثى	دير استيا	سلفيت	اساسي	ربة بيت
56	صبحة مصطفى الداوود	دير استيا	1927	انثى	دير استيا	سلفيت	امي	ربة بيت
57	وردة محمد مصطفى دياب	كولية	1927	انثى	دير استيا	سلفيت	امي	ربة بيت
58	محمود مصطفى يوسف داوود	دير استيا	1924	ذكر	دير استيا	سلفيت	اساسي	بلا عمل
59	رسمية عبد الكريم حسين	كفر الديك	1956	انثى	كفر الديك	سلفيت	امي	مزارعة
60	حسنة عبد الكريم	كفر الديك	1946	انثى	كفر الديك	سلفيت	امي	ربة بيت
61	حسنة اسماعيل	كفر الديك	1932	انثى	كفر الديك	سلفيت	امي	ربة بيت
62	بهية عوض سليمان	دير بلوط	1937	انثى	كفر الديك	سلفيت	امي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
63	هدية حسين حسن	كفر الديك	1925	انثى	كفر الديك	سلفيت	امي	ربة بيت
64	عودة عبد المحسن الترك	كفر الديك	1946	ذكر	كفر الديك	سلفيت	اساسي	بلا عمل
65	عزيزة يعقوب صالح	كفر الديك	1956	انثى	كفر الديك	سلفيت	امي	ربة بيت
66	عبد الله عبد المحسن عبد الرحمن	كفر الديك	1920	ذكر	كفر الديك	سلفيت	امي	بلا عمل
67	بشير صدقي محمود إصبيح	العقبة	1960	ذكر	العقبة	طوباس	ثانوي	عامل
68	محمد علي علي إصبيح	العقبة	1945	ذكر	العقبة	طوباس	اساسي	مزارع
69	امنة حمدان غوري	تياسير	1953	انثى	العقبة	طوباس	اساسي	ربة منزل
70	امنة عوض دراغمة	طوباس	1925	انثى	العقبة	طوباس	امي	ربة منزل
71	سامي صادق محمود إصبيح	العقبة	1955	ذكر	العقبة	طوباس	ثانوي	موظف
72	فوزية فايز إصبيح	تياسير	1945	انثى	العقبة	طوباس	امي	ربة منزل
73	عبد الله احمد دراغمة	تياسير	1951	ذكر	العقبة	طوباس	اساسي	تاجر
74	فتحية محمد دراغمة	طوباس	1957	انثى	العقبة	طوباس	أساسي	ربة منزل
75	سليمان محمود كوبري	العقبة	1922	ذكر	العقبة	طوباس	امي	بلا عمل
76	علي حسن جابر	تياسير	1922	ذكر	تياسير	طوباس	امي	بلا عمل
77	محمد فارس فياض إصبيح	تياسير	1952	ذكر	تياسير	طوباس	اساسي	مزارع
78	نوال حسن وهدان	تاسير	1949	انثى	تياسير	طوباس	اساسي	ربة منزل
79	محمود سليمان محمود ابو حسن	طوباس	1945	ذكر	تياسير	طوباس	دبلوم	متقاعد
80	احمد علي جابر	تياسير	1953	ذكر	تياسير	طوباس	اساسي	مزارع
81	احمد جميل يوسف إصبيح	تياسير	1951	ذكر	تياسير	طوباس	اساسي	موظف
82	مريم مصطفى محمد قاسم	تياسير	1953	انثى	تياسير	طوباس	اساسي	ربة منزل
83	حليمة يوسف حسين	تياسير	1957	انثى	تياسير	طوباس	اساسي	ربة منزل
84	ندية صدقي محمود إصبيح	تياسير	1953	انثى	تياسير	طوباس	اساسي	ربة منزل
85	فريال خليل اسعد ابو الرب	نابلس	1942	انثى	النزلة الوسطى	طولكرم	دبلوم	ربة بيت
86	سليمان عبد المعطي سليمان ابو الرب	النزلة الوسطى	1940	ذكر	النزلة الوسطى	طولكرم	اساسي	عامل
87	فاطمة عبد المعطي ابو الرب	المنة	1944	انثى	النزلة الوسطى	طولكرم	امي	ربة بيت
88	حليمة عبد المعطي ابو الرب	النزلة الوسطى	1948	انثى	النزلة الوسطى	طولكرم	امي	ربة بيت
89	عديلة يوسف شناعة	ام الشوف	1947	انثى	النزلة الوسطى	طولكرم	امي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
90	مسعود سعيد مسعود حج حمد	بلعا	1953	ذكر	بلعا	طولكرم	ثانوي	تاجر
91	كريمة كامل مسعود زيدان	بلعا	1947	انثى	بلعا	طولكرم	امي	تاجر
92	فايز محمود محمد	بلعا	1939	ذكر	بلعا	طولكرم	اساسي	تاجر
93	محمد حسن ذيب مرعي	بلعا	1955	ذكر	بلعا	طولكرم	دبلوم	عامل
94	يسرى الحج مسعود	بلعا	1936	انثى	بلعا	طولكرم	امي	ربة بيت
95	فتحية يوسف جمعة	بيت ليد	1957	ذكر	بيت ليد	طولكرم	اساسي	ربة بيت
96	أحمد عبد الله جمعة	بيت ليد	1951	انثى	بيت ليد	طولكرم	ثانوي	تاجر
97	عزيزة أحمد قاسم جمعة	بيت ليد	1942	انثى	بيت ليد	طولكرم	امي	ربة بيت
98	صديقة عبد الفتاح حج ابراهيم	بيت ليد	1930	انثى	بيت ليد	طولكرم	امي	ربة بيت
99	قاسم يوسف حمدان	بيت ليد	1927	ذكر	بيت ليد	طولكرم	اساسي	بلا عمل
100	شريفة سعيد عبد العزيز عامر	بيت ليد	1954	انثى	بيت ليد	طولكرم	اساسي	ربة بيت
101	فتحية عبد الله شايب	بيت ليد	1933	انثى	بيت ليد	طولكرم	امي	ربة بيت
102	فدوى احمد عبد الكريم عوض	عنبتا	1951	انثى	عنبتا	طولكرم	دبلوم	ربة بيت
103	امل مصطفى عبد العزيز زايد	عنبتا	1955	انثى	عنبتا	طولكرم	ثانوي	ربة بيت
104	حسان محمد شحادة	عنبتا	1950	ذكر	عنبتا	طولكرم	دبلوم	تاجر
105	امينة اسعد ابو كامل	عنبتا	1922	انثى	عنبتا	طولكرم	امي	ربة بيت
106	رسمية محمد سنجق	عنبتا	1948	انثى	عنبتا	طولكرم	امي	ربة بيت
107	غازي محمد رجا خصب	قفين	1952	ذكر	قفين	طولكرم	جامعي	تاجر
108	عايشه محمد مسعود خصب	قفين	1925	انثى	قفين	طولكرم	امي	ربة بيت
109	ابراهيم محمد رجا خصب	قفين	1957	ذكر	قفين	طولكرم	جامعي	موظف
110	ندية حج فريد سعيد خصب	قفين	1941	انثى	قفين		امي	ربة بيت
111	محمدسعيد نمر ذيب خصب	قفين	1939	ذكر	قفين	طولكرم	اساسي	بلا عمل
112	ربحية محمود ابو ليلى	كفر اللبد	1947	انثى	كفر اللبد	طولكرم	امي	ربة بيت
113	امنة محمود عثمان	كفر اللبد	1935	انثى	كفر اللبد	طولكرم	امي	ربة بيت
114	عايشة عبد الله ابو حمش	كفر اللبد	1927	انثى	كفر اللبد	طولكرم	امي	ربة بيت
115	فتحية ذيب عبد الله	كفر اللبد	1937	انثى	كفر اللبد	طولكرم	امي	ربة بيت
116	سعد عبد الله ذيب الاسود	كفر اللبد	1957	ذكر	كفر اللبد	طولكرم	جامعي	بلا عمل
117	زهرية فهمي يعقوب	كفر رمان	1950	انثى	كفر رمان	طولكرم	اساسي	ربة بيت
118	مها محمود محمدسعيد الحلبي	كفر رمان	1954	انثى	كفر رمان	طولكرم	اساسي	ربة بيت
119	سميرة رشيد حمدان	كفر رمان	1951	انثى	كفر رمان	طولكرم	اساسي	ربة بيت
120	دنياز محمد عبد الرحمن	كفر رمان	1955	انثى	كفر رمان	طولكرم	اساسي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
121	وجيهة عبد الله حمد	كفر رمان	1922	انثى	كفر رمان	طولكرم	امي	ربة بيت
122	امينة عبد اللطيف حسن	الفندق	1931	انثى	الفندق	قلقيلية	امي	ربة بيت
123	امينة نمر يوسف اشقر	كفر لاقف	1958	انثى	الفندق	قلقيلية	اساسي	ربة بيت
124	ابتسام محمود محمد واكد	جيوس	1964	انثى	الفندق	قلقيلية	اساسي	ربة بيت
125	سهيل عبد اللطيف حسن اشكر	الفندق	1950	ذكر	الفندق	قلقيلية	دبلوم	موظف
126	فريد محمد يوسف	الفندق	1936	ذكر	الفندق	قلقيلية	اساسي	تاجر
127	رسمية اسعد ابراهيم سليمان	عزون	1959	انثى	النبي الياس	قلقيلية	اساسي	ربة بيت
128	عدله اسعد عبد الله زماري	تبصر	1944	انثى	النبي الياس	قلقيلية	امي	ربة بيت
129	رابعة رشدي عليان رضوان	النبي الياس	1964	انثى	النبي الياس	قلقيلية	دبلوم	ربة بيت
130	وصفية اسعد غنام خليف	النبي الياس	1953	انثى	النبي الياس	قلقيلية	امي	ربة بيت
131	كامله محمد خلف	عزون	1948	انثى	النبي الياس	قلقيلية	امي	ربة بيت
132	زكية احمد قاسم خروب	حبله	1939	انثى	حبله	قلقيلية	امي	ربة بيت
133	محمد محمود خروب	حبله	1954	ذكر	حبله	قلقيلية	اساسي	تاجر
134	فائقة كامل هاني قرعان	شيخ مؤنس	1948	انثى	حبله	قلقيلية	امي	ربة بيت
135	نهله عبد الفتاح شواهنه	حبله	1956	انثى	حبله	قلقيلية	امي	ربة بيت
136	حليمة اسماعيل عمر	سنيريا	1966	انثى	حبله	قلقيلية	اساسي	ربة بيت
137	سعاد حسين بصلات	حجة	1926	انثى	حجة	قلقيلية	امي	ربة بيت
138	نمر مسعود عبد القادر بصلات	حجة	1926	ذكر	حجة	قلقيلية	اساسي	بلا عمل
139	عزام نمر مسعود	حجة	1952	ذكر	حجة	قلقيلية	دبلوم	بلا عمل
140	صبحة جمال نوفل	حجة	1956	انثى	حجة	قلقيلية	ثانوي	ربة بيت
141	محمود عبد الله حامد نوفل	حجة	1924	ذكر	حجة	قلقيلية	امي	بلا عمل
142	عاقلة صالح سالم سويدان	عزون	1952	انثى	عزون	قلقيلية	اساسي	ربة بيت
143	مصطفى داوود محمد عودة	كفر ثلث	1946	ذكر	عزون	قلقيلية	اساسي	بلا عمل
144	عريفة احمد عمر سويدان	حبصر	1933	انثى	عزون	قلقيلية	امي	ربة بيت
145	ام يوسف غازي على اسحاق	الاردن	1959	انثى	عزون	قلقيلية	اساسي	ربة بيت
146	جميله صالح رمضان	عزون	1927	انثى	عزون	قلقيلية	امي	ربة بيت
147	ختام عزت	بورين	1952	انثى	بورين	نابلس	اساسي	ربة بيت
148	رحمة اسماعيل	بورين	1944	انثى	بورين	نابلس	اساسي	ربة بيت
149	هند مصطفى عبد القادر	بورين	1940	انثى	بورين	نابلس	امي	ربة بيت
150	فهيمة عبد الرحمن هندي	بورين	1908	انثى	بورين	نابلس	امي	ربة بيت
151	صفية محمد داود	بورين	1900	انثى	بورين	نابلس	امي	ربة بيت
	كوكب اسماعيل	بورين	1955	انثى	بورين	نابلس	اساسي	ربة بيت
152	علي أحمد ابراهيم عبيد	نابلس	1949	ذكر	بيت ايبا	نابلس	دبلوم	تاجر
153	عدله محمد ياسين	بيت ايبا	1940	انثى	بيت ايبا	نابلس	اساسي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
154	سعاد عبد الرحمن اشتيوي	نابلس	1955	انثى	بيت ايبا	نابلس	ثانوي	ربة بيت
155	اسيا محمد يوسف قباله	قوصين	1942	انثى	بيت ايبا	نابلس	امي	ربة بيت
156	فايزة محمد عبد الكريم	دير الحطب	1935	انثى	دير الحطب	نابلس	أمي	ربة بيت
157	وفيقة ابراهيم عمران	دير الحطب	1935	انثى	دير الحطب	نابلس	امي	ربة بيت
158	رئيسة أنيس مشحطي	حيفا	1948	أنثى	دير الحطب	نابلس	أمي	ربة بيت
159	صبحية محمد حسين عودة	يافا	1942	انثى	دير الحطب	نابلس	امي	ربة بيت
160	ربحي سعيد علمان	دير الحطب	1950	ذكر	دير الحطب	نابلس	جامعي	موظف
161	خيرية حسن ابراهيم فقها	دير شرف	1956	انثى	دير شرف	نابلس	اساسي	ربة بيت
162	محمد عبد الحافظ فقها	دير شرف	1954	ذكر	دير شرف	نابلس	ثانوي	تاجر
163	يسرى حامد فقها	دير شرف	1951	انثى	دير شرف	نابلس	اساسي	ربة بيت
164	شريفه ابراهيم حسن فقها	دير شرف	1952	انثى	دير شرف	نابلس	اساسي	ربة بيت
165	فاطمة القبلاني	دير شرف	1930	انثى	دير شرف	نابلس	اساسي	ربة بيت
166	احمد يوسف اسمر	روجيب	1948	ذكر	روجيب	نابلس	اساسي	مزارع
167	خيري فوزي جبر دويكات	روجيب	1953	ذكر	روجيب	نابلس	اساسي	مزارع
168	حسين مصطفى ابو عيشة	روجيب	1949	ذكر	روجيب	نابلس	اساسي	مزارع
169	شاهر صايل حلبي	روجيب	1942	ذكر	روجيب	نابلس	اساسي	مزارع
170	سعدي كامل دويكات	روجيب	1957	ذكر	روجيب	نابلس	اساسي	مزارع
171	عبد الرؤوف عبد الرحيم حسين	زيتا جماعين	1946	ذكر	زيتا جماعين	نابلس	دبلوم	تاجر
172	فايزة خالد منصور	ديراستيا	1957	انثى	زيتا جماعين	نابلس	دبلوم	موظفة
173	فايزة محمود عبد الله حسين	زيتا جماعين	1943	انثى	زيتا جماعين	نابلس	اساسي	ربة بيت
174	فاطمة عامر عبد الباقي	زيتا جماعين	1936	انثى	زيتا جماعين	نابلس	امي	ربة بيت
175	فايزة حسين ابراهيم رمضان	جماعين	1950	انثى	زيتا جماعين	نابلس	ثانوي	ربة بيت
176	عبد لبغني سليمان كنعان	زيتا	1957	ذكر	زيتا جماعين	نابلس	ثانوي	عامل
177	عزية احمد اشتيه	سالم	1957	انثى	سالم	نابلس	امي	ربة بيت
178	رفيقة محمد حسن	سالم	1943	انثى	سالم	نابلس	امي	ربة بيت
179	سليمان مصطفى موسى	سالم	1949	ذكر	سالم	نابلس	اساسي	تاجر
180	عزيزة محمود احمد	صرة	1937	انثى	صرة	نابلس	امي	ربة بيت
181	نجاح هندي (ام حاتم)	صرة	1940	انثى	صرة	نابلس	امي	ربة بيت
182	عريفة عبد العزيز	سيلة الظهر	1927	انثى	صرة	نابلس	امي	ربة بيت

الرقم	الاسم	مكان الميلاد	تاريخ الميلاد	الجنس	مكان السكن		التحصيل العلمي	المهنة
183	فتحي جميل عبد الرحيم الترابي	صرة	1951	ذكر	صرة	نابلس	اساسي	مزارع
184	ابراهيم سعيد حسن علاونه	عزموط	1930	ذكر	عزموط	نابلس	اساسي	عامل
185	فرج سعيد حسن علاونة	عزموط	1946	ذكر	عزموط	نابلس	اساسي	بلا عمل
186	فتحية فرحان حسن علاونة	عزموط	1945	انثى	عزموط	نابلس	امي	ربة بيت
187	فهمية مصطفى	عزموط	1948	انثى	عزموط	نابلس	امي	ربة بيت
188	فايق احمد حسن الشامي	عصرة القبلية	1954	ذكر	عصيرة القبلية	نابلس	ثانوي	بلا عمل
189	عبد الرحيم محمد عبد الرحمن خلف	عصرة القبلية	1940	ذكر	عصيرة القبلية	نابلس	اساسي	بلا عمل
190	عبد الرحيم طه العبد طه	عصرة القبلية	1932	ذكر	عصيرة القبلية	نابلس	امي	بلا عمل
191	احمد شريف عبد الجواد صالح	عصرة القبلية	1933	ذكر	عصيرة القبلية	نابلس	امي	بلا عمل
192	محمد حسن مطلق حمدان	عصرة القبلية	1951	ذكر	عصيرة القبلية	نابلس	ثانوي	عامل
193	عبد الحميد باسم بني فضل	عقربا	1948	ذكر	عقربا	نابلس	جامعي	موظف
194	صدقي عبد الكريم ابو مرشح	عقربا	1930	ذكر	عقربا	نابلس	اساسي	بلا عمل
195	استراح محمود سعادة الأسمر	عقربا	1955	انثى	عقربا	نابلس	دبلوم	ربة بيت
196	نجلاء عارف عبد الفتاح عبد المجيد	عقربا	1938	انثى	عقربا	نابلس	امي	ربة بيت
197	معزوزة يوسف	عقربا	1943	انثى	عقربا	نابلس	امي	ربة بيت
198	محمد سلامة أبو لمية	عقربا	1933	ذكر	عقربا	نابلس	اساسي	بلا عمل
199	عيد هلال أبو لمية	عقربا	1955	ذكر	عقربا	نابلس	اساسي	عامل
200	نادية شاهر صفدي	كفر ثلث	1953	انثى	عوريف	نابلس	دبلوم	ربة بيت
201	شاهرعبد السميع لاصفدي	عوريف	1930	ذكر	عوريف	نابلس	جامعي	موظف
202	امنة فايزة محمد شحادة	عوريف	1946	انثى	عوريف	نابلس	امي	ربة بيت
203	يسرا جمال جميل شحادة	يافا	1947	انثى	عوريف	نابلس	دبلوم	ربة بيت
204	نهلة حسن ابراهيم عبد ربه	دير شرف	1953	انثى	قوصين	نابلس	اساسي	ربة بيت
205	اعتدال محمد عبد ربه	قوصين	1954	انثى	قوصين	نابلس	اساسي	ربة بيت
206	بهية محمد عبد ربه	سبسطية	1933	انثى	قوصين	نابلس	امي	ربة بيت
207	عايد محمد عبد ربه	قوصين	1950	ذكر	قوصين	نابلس	اساسي	عامل
208	عبد الرحمن عبد القادر عبد ربه	قوصين	1957	ذكر	قوصين	نابلس	ثانوي	تاجر
209	أسعد عارف أسعد ظاهر	ياصيد	1954	ذكر	ياصيد	نابلس	دبلوم	موظف
210	مصطفى كامل مصطفى ظاهر	ياصيد	1957	ذكر	ياصيد	نابلس	ثانوي	موظف
211	نصفت غالب مصطفى ظاهر	ياصيد	1955	ذكر	ياصيد	نابلس	دبلوم	موظف
212	وجيه يوسف مصطفى ظاهر	ياصيد	1957	ذكر	ياصيد	نابلس	ثانوي	عامل
213	ثريا حميد محمود ظاهر	سيريس	1930	انثى	ياصيد	نابلس	امي	ربة بيت
214	شهيرة نايف عبد الرحيم	نصف جبيل	1935	انثى	ياصيد	نابلس	امي	ربة بيت

Appendices C

Questionnaire

رقم الإستبانة ..... التاريخ ..... استبانة النباتات البرية التي تستخدم كغذاء في المجتمعات الفلسطينية شمال الضفة الغربية

الإستبانة العامة (يعبأ هذا الجزء لجميع الافراد المشتركين في الدراسة)

1 - الإسم : .....

2 مكان وتاريخ الميلاد : .....

3 الجنس : □ ذكر □ أنثى

4 الحالة الإجتماعية : □ أعزب □ متزوج □ أرمل □ مطلق

5 مكان السكن : .....

6 رقم الهاتف : .....

7 التحصيل العلمي : □ أمي □ أساسي □ ثانوي □ ديلوم □ جامعي (بكالوريوس ، ماجستير ، دكتوراة)

8- المهنة : □ ربة بيت □ موظف □ عامل □ تاجر □ بلا عمل

9 عدد أفراد الأسرة : □ ذكر □ أنثى

10- الفئات العمرية لأفـــراد الأسرة :□ 1-6 سنوات □ 6-12 □ 12-18 □ 18- 24 □ 24-30 □ 30- 36 □ 36-42 □ 42- فاعلى

11- التحصيل العلمي لأفـراد الأسرة : □ مرحلة ما قبل المدرسة □ أساسي (1-10) □ ثانوي (11-12) □ ديلوم □جامعي (بكالوريوس ، ماجستير ، دكتوراة)

القسم الثاني : النباتات البرية التي تستخدم كغذاء (غذاء،محسنات طعام ،أو النكهة ،للتزيين .....) في المجتمعات الفلسطينية شمال الضفة الغربية

1 من أين تحصل على النباتات البرية التي تستخدم كغذاء (مادة غذائية ، توابل ، بهار، محسنة للطعم، للتزين....)

□ شراء من السوق □ جمع من الطبيعة □ تزرعها بنفسك
□ غير ذلك.

2 كم يبلغ ثمن (تكلفة) النباتات البرية التي تستخدمها الأسرة كغذاء في السنة (بالشيكل)

□ أقل من 100 □ 100 500 □ 500 1000 □ 1000 1500 1500

3 من أين حصلت أو تحصل على المعرفة المرتبطة من النباتات البرية التي تستخدمها كغذاء

□ من الاباء والأجداد □ من الأشخاص الأكبر سنا (الجيران) □من المجلات و الوسائل السمعية والمرئية □مصادر أخرى

.....

4- هل يوجد هناك بعض أنواع النباتات البرية تستخدمها بشكل متكرر ؟ □ نعم □ لا

إذا كانت إجابتك نعم / اذكر هذه النباتات :

.....

.....

5- ما هي النباتات البرية التي تستخدمها كغذاء؟

.....

.....

6- أي من هذه النباتات يصعب الحصول عليها من الطبيعة في الوقت الحاضر؟

.....

.....

7 - ما مدى إعتمادك على النباتات البرية في الغذاء ؟ □ توفير الغذاء لأفراد الأسرة □ مصدر دخل للأسرة □ الإثنين معا

8- مالذي يجعلك تفضل نبات بري عن اخر كغذاء ؟

□ سهولة التحضير □ القيمة الفذائة □ لذة المذاق

رقم الإستبانة ..... التاريخ ..... استبانة النباتات البرية التي تستخدم كغذاء في المجتمعات الفلسطينية شمال الضفة الغربية

9- هل هناك نباتات برية كنت تستخدمها كغذاء في السابق قبل نحو 15 عاما وقد اختفت حاليا من الطبيعة تماما ؟ إذا كانت إجابتك نعم اذكرها

.....

.....

10 بحسب رأيك مالعوامل التي تهدد النباتات البرية التي تستخدم كمصدر للغذاء ؟

□ الرعي الجائر □ امتداد الأراضي الزراعية على حساب المناطق الطبيعية □ الحرائق العشوائية

□ المبيدات الزراعية □ قطع النباتات لاستخدامها في الانشاءات □ إستخدام النباتات كمصدر للطاقة

11- كيف يمكنك المساهمة في المحافظة على النباتات البرية التي تستخدم في الغذاء من الإنقراض؟

.....

.....

12- إذا أبدت إحدى المؤسسات استعدادا لتزويدك بنباتات برية تستخدمها كغذاء ذات نوعية جيدة، فهل كنت تشتريها ؟

□ نعم □ لا

13 أيهما أكثر أهمية بالنسبة لك ؟

.....

14- هل تشعر بأن استخدام النباتات البرية التي تستخدمها كغذاء يغنيك في بعض الأحيان وأفراد أسرتك عن شراء بعض الخضراوات أو الفواكه من السوق ؟ □ نعم □ لا

15- المبلغ الشهري بالدينار الذي توفره الأسرة نتيجة استخدام النباتات البرية في الغذاء :

.....

16 هل تفضل إستخدام النباتات البرية في الغذاء على النباتات الزراعية ؟ □ نعم □ لا

17- إذا كانت الإجابة بنعم ، فلماذا ؟ □ ذات قيمة غذائية مرتفعة □ سهولة الحصول عليها □ أقل كلفة □ غير ذلك

بطاقة نبات بري صالح للأكل :..... رقم الإستبانة ..... التاريخ :.....

نباتات برية تستعمل بشكل رئيسي لأغراض غذائية

مصدر المعلومات (إسم الشخص الذي أعطى المعلومات (
:.....

مكان الإقامة : القرية ..... المحافظة .....

النبات / الإسم الشائع :
.....

الجزء المستخدم : □ الأزهار □ الأوراق □ السيفان □ المجموع الخضري □ البذور

□ الثمار □ الدرنات □ الجزء المتشحم □ أجزاء أخرى .....

الغرض من إستخدام النبات :

□ غذاء رئيسي في الطعام □ توابل □ بهارات □ حلوى □ تزيين الطعام

□ حفظ الغذاء □ غير ذلك .....

أنماط إستهلاك النبات :

□ طازجة (نيئة) (سلطة ، عصير ، فاكهة .....)

□ مطبوخة (مغلي، مقلي، مشوي ، شوربة .....)

□ محفوظة (تجميد ، مجففة ، مخللات ، مربى)

طريقة التحضير

طريقة الإعداد :

.....

.....

هل يوجد أدوات تقليدية تستخدمها في تخضير النبات (هاون ، غربال ، مهباش ، طاحونة حجر .....)؟

إذا كانت الإجابة نعم ، اذكرها

.....

بطاقة نبات بري صالح للأكل :..... رقم الإستبانة ..... التاريخ :.....

النباتات الرئيسية التي تستعمل في فلسطين لأغراض علاجية، تجميلية، إجتماعية ، أو ثقافية

مصدر المعلومات (إسم الشخص الذي أعطى المعلومات (
:.....
مكان الإقامة : القرية ..... المحافظة
.....
النبات / الإسم الشائع :

.....

الحالات التي يستخدم في علاجها :

.....

الجزء المستخدم : □ الأزهار □ الأوراق □ السيقان □ المجموع الخضري □ البذور
□ الثمار □ الدرنات □ الجزء المتشحم □ أجزاء أخرى
.....

الحالات التي يستخدم النبات في علاجها	الجزء المستخدم	طريقة التحضير (المقادير المستخدمة،طريقة الإعداد،المغلي، المنقوع في ماء مغلي،المنقوع في ماء بارد ، اللبخة)	طريقة الإستعمال	الجرعة (الكمية، عدد فترات الإستخدام،وموعد الإستخدام)	طول فترة الإستخدام

هل تقوم بتحضير الوصفات الطبية بنفسك؟ □ نعم □ لا
من أين تحصل على هذا النبات ؟
جمع من الطبيعة (%) شراء من السوق(%) شراء من المزارعين (%)
زراعتها (%) إذا كنت تجمع النبات : موعد الجمع ..... الكمية التي
تجمع سنويا (كغم) مكان الجمع : □ جوانب الطرق

□ الحقول الزراعية □ مناطق برية طبيعية (شجيرية أو اشجار صعيرة) □ غابات (خراش طبيعية)

إذا كنت تزرع النبات : موعد الزراعة ..... مصدر التقاوي (البذور أو الأشتال (
المساحة المزروعة :..... الغرض من الزراعة
: ..... كمية الإنتاج السنوي :
.....
طريقة إعداد النبات للتخزين :

..... طريقة التخزين.....

: □ مجففة ومحفوظة في أكياس بلاستيكية □ التجميد
: □ مجففة ومحفوظة في أوعية زجاجية أو بلاستيكية محكمة الإعلاق □ تحفظ في الثلاجة في أوعية زجاجية أو بلاستيكية طرق أخرى (اذكرها) :
..... طول
فترة التخزين : : □ أقل من عام □ عام □ أكثر من عام
هل تجد صعوبة في الحصول على النبات ؟ □ نعم □ لا
كم تبلغ كمية وثمن النبات الطبي الذي يستهلك في السنة ؟

.....

استعمالات أخرى : □ اجتماعية □ ثقافية □ رمزية □ للتجميل □ للظل □ وقود □ لأعمال البناء □ لصناعة الحبال □ الطقوس الدينية(الشعوذة،تحضير الأرواح) □ للرعي □ عمل عكازات

□ عمل السلال □ العصارة اللبنية أمثلة شعبية / إعتقادات حول النبات :

.....

هل تستعمل النبات لأغراض طبية ؟ □ نعم □ لا

إذا كانت الإجابة نغم ، اذكرها :

الإستخدام الطبي	الجزء المستخدم	طريقة التحضير (المقادير المستخدمة ، طريقة الإعداد)	طريقة الإستعمال	الجرعة (الكمية، عدد المرات،موعد الإستخدام)	طول فترة الإستخدام	شكل الإستخدام

شكل الإستخدام : □ مغلي □ منقوع بماء بارد □ منقوع بماء ساخن □ تبخير □ لبخة □ دهون □ شراب

من أين تحصل على هذا النبات :

جمع من الطبيعة (%) شراء من السوق(%) شراء من المزارعين (%) زراعتها (%)

إذا كنت تجمع النبات : موعد الجمع ..... الكمية التي تجمع سنويا (كغم)

مكان الجمع : □ جوانب الطرق □ الحقول الزراعية □ مناطق برية طبيعية (شجيرية أو اشجار صغيرة)

□ غابات (أخراش طبيعية)

إذا كنت تزرع النبات : موعد الزراعة .....

مصدر التقاوي (البذور أو الأشتال) .....

المساحة المزروعة :.....

الغرض من الزراعة : .....

كمية الإنتاج السنوي :

.....

هل تقوم بتخزيم النبات ؟ □ نعم □ لا

طريقة إعداد النبات للتخزين :

.....

طريقة التخزين : □ مجففة ومحفوظة في أكياس بلاستيكية □ التجميد

□ مجففة ومحفوظة في أوعية زجاجية أو بلاستيكية محكمة الإعلاق □ تحفظ في الثلاجة في أوعية زجاجية أو بلاستيكية

طرق أخرى (اذكرها) :

.....

طول فترة التخزين : : □ أقل من عام □ عام □ أكثر من عام

هل تجد صعوبة في الحصول على النبات ؟ □ نعم □ لا

استعمالات أخرى : □ اجتماعية □ ثقافية □ رمزية □ للتجميل □ للظل □ وقود □ لأعمال البناء □ لصناعة

الحبال □ الطقوس الدينية(الشعوذة،تحضير الأرواح) □ للرعي □ عمل عكازات □ عمل السلال □ العصارة اللبنية □ دوائية □ مضاد للحشرات □ مقاومة للافات

أمثلة شعبية / إعتقادات حول النبات :

.....

اسم الشخص الذي قام بجمع المعلومات : ..... التاريخ : .....

Appendix D

Wild food plants (cited by ≥3 informants) traditionally consumed and number of informants that mentioned each food – use in the survey areas. N, Nablus; Q, Qalqilia, J, Jenin; Tul, Tulkarm; T, Tubas; S, Salfit.

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	Tul	T	S	Food use category	Part used, way of consumption
Anacardiaceae											
Rhus coriaria	Sumach	سماق	8	3	2	3				Seasoning	Fruits , use as condiment on food and thyme.
Apiaceae (Umbelliferae)											
Anisum vulgare	Anise	يانسون	13	2	11					Seasoning	Seeds,use as condiment on food and thyme.
Coriandrum sativum	Coriander	كزبرة	7					7		Vegetables	Leaves,eaten cooked.
Eryngium creticum	Snake Root	قرصعنة	11	1	3	2	5			Vegetables	Leaves,eaten cooked.
Foeniculum officinale	Sweet fennel	شومر	50	8	5	7	4			Vegetables	Leaves, eaten raw as salad.
				9	5	7				Vegetables	Stems, cooked.
					5					Herbal tea	Leaves, add to tea.
Tordylium aegyptiacu	Egyptian Hartwort	دريهمة	6					6		Fruits	Fruits,eaten raw.
Araceae											
Arum palaestinun	Spotted arum	لوف	161	46	19	32	31	18	15	Vegetables	Leaves, eaten cooked.
Eminium soiculatum	_____	صميعة	6	6						Vegetables	Leaves raw, add to salad.

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	T ul	T	S	Food use category	Part used, way of consumption
Asteraceae (Compositae)											
Centaurea dumulosa	Shrubby Centaury	مرار	77	15	2	13	7	18	7	Vegetables	Leaves, eaten raw.
					1		7		7	Vegetables	Leaves, eaten cooked.
Gundelia tournefortii	Gundelia	عكوب	148	43	14	27	33	18	13	Vegetables	Young stems, inflorescence. Cooked with meat and yoghurt.
Lactuca sativa	Lettuce	خس بري	30	3	3	4	2	11	7	Vegetables	Leaves raw, add to salad.
Matricaria aurea	Golden cotula	بابونج	45	12		9	5	18	1	Seasoning	Foliage, add to tea as a condiment.
Scorzonera papposa	Oriental Viper's Grass	ذبح	20	5	2			1	6	Seasoning	Leaves, eaten raw as salad.
									6	Vegetables	Leaves, eaten cooked with onion.
Silybum marianum.	Holy Thistle , Milky Thistle	خرفيش	56	3		15	8	10	6	Vegetables	Leaves, eaten raw.
					1	13				Vegetables	Stems, coocked.
Taraxacum officinale	Dendelion	هندباء	126	41	9	33	26	9	8	Vegetables	Leaves, eaten cooked.
Cruciferae (Brassicaceae)											
Eruca sativa	Garden rocket	جرجير	38	6	5	13	10		4	Vegetables	Leaves, eaten raw as salad.
Sinapis arvensis	Wild mustard	خردل	62	10	1	17	13	18	3	Vegetables	Leaves, eaten raw as salad.
Nasturtium officinale	_____	حويرنة	28	1		6	1	5	15	Vegetables	Leaves, eaten raw as salad.

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	T ul	T	S	Food use category	Part used, way of consumption
Labitate											
Cordiothymus capitatus	Capitate thyme	زعتـــــر فارسي	46	4	9	6		9		Herbal tea	Leaves,herbal tea..
					9					Seasoning	Add to thyme with wheat.
					9					Vegetables	Leaves,eaten raw as salad.
Majorana syriaca	Wild thyme, mother of thyme	زعتر بري	324	27	25	51	37	18	15	Vegetables	Leaves,coocked as pastry,dried and mix with wheat.
				18		51	37			Food decoration	Leaves, fresh leaves add to food decoration.
				37	25			18	15	Vegetables	Leaves, coocked with egg.
Mentha longifolia	Horse Mint	نعنع بري	15					5	3	Vegetables	Leaves,eaten raw as salad.
								5	2	Vegetables	Leaves dried and coock with yoghurt.
Micromeria fruticosa	Thyme	زعتـــــر البلاط	8				5		3	Herbal tea	Leaves,herbal tea..
Rosmarinus officinalis	Rosemary	حصالبان	7			2			5	Foliage	Foliage,boiled with water and be drunk.
Salvia fruticosa	White sage,common sage	ميرمية	95	13	15	30	9	18	10	Seasoning	Leaves, add to tea.
Salvia hierosolymitana	Jerusalem sage	لسينة	173	60	23	25	32	18	15	Vegetables	Leaves, cooked with rice and meat.

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	T ul	T	S	Food use category	Part used, way of consumption
Teucrium polium	Cat thyme	جعدة	46			22	6	18		Vegetables	Leaves,cooked as snack, or coocked and eaten with rice.
Lauraceae											
Laurus nobilis	Laurel, Sweet bay	غار	4		1		3			Seasoning	Leaves, add to food as acondiment.
	Leguminosae (Papilionaceae)										
Ceratonia siliqua	Caroob	خروب	3		2				1	Fruits	Fruits, eaten raw, prepared as juice.
Lathyrus belpharicarpusgor goneiparl	_____	سيسعة	3		1				2	Fruits	Fruits, eaten raw.
Psoralea bituminosa	_____	عوينة	9			9				Vegetables	Leaves, add to thyme.
Tetragonlobus palaestinus	_____	سيبعة	16	4		1	1	7	3	Fruits	Fruits, eaten raw.
Trigonella foenum	Fenugreek seed	حلبة	32	4	11	8	6		3	Fruits	Seeds,coocked to make sweets.
Vicia narbonensis	Purple Broad Bean	بريدة	6					1	5	Fruits	Fruits, eaten raw.
Liliaceae											
Gagea chlorantha	Gagea	زعيتمان	89	6	8	14	5	18	6	Herbal tea	Leaves, add to tea.
				7	8		4			Seasoning	Leaves, add to thyme with wheat.
				7	6					Vegetables	Leaves, cooked with oil and onion.

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	T ul	T	S	Food use category	Part used, way of consumption
Asparagus aphyllus	Prickly Asparagus	هليون	13			2	3	8		Vegetables	Stems , cooked with oil.
Moraceae											
Ficus sycomorus	Sycamore	جميز	21	21						Fruits	Fruits, eaten raw.
Oxalidaceae											
Oxalis pes-caprae	Wood Sorrel	حمصيص	6					6		Seasoning	Leaves, added to food as a condiment.
Polygonaceae											
Malva sylvestris	Common mallow	خبيزة	171	61	23	37	32	18		Vegetables	Leaves, cooked as snack, or cooked and eaten with rice.
Rumex acetosa	Sorrel	حميض	88		10	23	25	18	12	Vegetables	Leaves ,cooked as pastry , or eaten raw as salad.
Rumex Patientia	Patience dock	سلق	51	6		12	8	18	7	Vegetables	Leaves, eaten cooked
Portulacaceae											
Portulaca oleracea	Purslane	بقلة	36		7	2	9	9		Vegetables	Leaves, cooked with tomato or Yoghurt.
							9			Vegetables	Leaves , eaten raw with bread.
Primulaceae											
Cyclamen persicum	Cyclamen	زعمطوط	183	59	24	30	37	18	15	Vegetables	Leaves, cooked with rice and meat.
Rahamnaceae											

Latin name	Common name	Arabic common name	No.of informants	N	Q	J	Tul	T	S	Food use category	Part used, way of consumption
Ziziphus spina-christi	Christs Thornjujube,Nabak	سدر	3					3		Vegetables	Leaves, cooked and eaten as snack.
	Ranunculaceae										
Nigella sativa	Nigella, black cumin	حبة البركة	24		11	2				Fruits	Seeds,, cooked to make sweets.
					11					Seasoning	Seeds, add to cheese as a condiment.
ROSACEAE											
Crataegus aronia	Spiny Hawthorn	زعرور	12	5			3	2	2	Fruits	Fruits, eaten raw.
Pyrus communis	Pear	اجـــــاص بري	9	8			1			Fruits	Fruits, eaten raw.
Prunus mahaleb.	Mahaleb Cherry	محلب	3				1			Herbal tea	Flowers, add to tea.
					2					Seasoning	Seeds, add to stored cheese as a condiment.
Tricholomataceae											
Agaricus bisporus	Mushroom	مشروم	43	5	1	14	3	10	10	Vegetables	Eaten cooked.
Urticaceae											
Urtica pilulifera	Roman Nettle	قريص	40	2	1	13	5	10	6	Vegetables	Stems, eaten raw as salad.
									3	Vegetables	Leaves, cooked.

Appendix E

Wild food plants (cited by 1 or 2 informants) traditionally consumed and number of informants that mentioned each food – use in the survey areas.

Common name	Latin name	Arabic common name	No.of informants	N	Q	J	Tul	T	S	Food use category	Art used, way of consumption
Asteraceae (Compositae)											
Pricyly Alkanet	*Anchusa strigosa.*	حمحم	2				2			Vegetables	Leaves, eaten raw as salad.
Cabbage	*Brassica oleracea*	ملفـــــوف عربي	1	1						Vegetables	Leaves, eaten cooked with rice and meat.
Corn Marigold	*Chrysanthemum coronarium*	بسباس	1				2			Vegetables	Stems, eaten raw.
Caryophyllaceae											
Silvery Whitlow-Wart	*Paronychia argentea Lam*	رجـــــــل الحمامة	2	2						Herbal tea	Foliage, herbal tea.
Leguminosae (Papilionacea)											
Blue Fenugreek	*Trigonella* sp	حلابية	2						2	Fruits	Seeds, fleshy seeds as eaten
Liliaceae											
Garlic	*Allium edrelli*	ثوم بري	1		1					Vegetables	Leaves, eaten cooked with rice and meat.
Moraceae											
Mulberry	*Morus alba*	توت بري	1	1						Fruits	Fruits, eaten raw.
Punicaceae											

Common name	Latin name	Arabic common name	No.of informants	N	Q	J	Tul	T	S	Food use category	Art used, way of consumption
Pomegranate	*Punica granatum*	رمان	1		1					Fruits	Fruits , eaten raw , prepared as juice.
ROSACEAE											
Almond	*Amygdalus communis*	لوز بري	1		1					Food	Seeds, dried seed add at the surface of cooked.

Appendices F

Wild edible plants as food medicines

Latin name	species	Arabic name	No. of informants	Disease	Part used. way of consumption	Administration	Dosage	the length of using
Allium erdelli	Garlic	ثوم بري	3	Pressure	Drinking from the solution mixture	Drinking from the solution mixture	Once /day	3 days
Amygdalus communis	Almond	لوز بري	2	Treatment of stomach	Eating small amount of dried seeds	Eating small amount of dried seeds.	Twice /day	Upon request
Anisum vulgare	Anise	يانسون	7	Amoeba , constipation and Hemorrhoids	100 gm of seeds boiled in 1 liter of water.	Drinking a cup of Anise after boiling it.	Big cup/day	One month
			3	Infections	Seeds boiled	Drinking the filtrate.	Twice /day	3 days
			2	Steady nerves	Seeds boiled .	Drinking the filtrate	Once / day	One week
Arum palaestinun	Spotted arum	لوف	2	Albumin disease	Leaves chipped, washed squeezed and then cooked with onion and oil.	Eating	3 times /day	One week
			1	Joint pain	Leaves squeezed very well and then rubbed on pain zone	Rubbing on pain place.	Twice/ day	upon request
			8	Stroke	Leaves chipped, washed squeezed and then cooked with onion and oil	Eating leaves after cooking.	3 times /day	upon request

			25	Cancer	Leaves chipped, washed squeezed and then cooked with onion and oil , or boiled then filtered.	1. Eating leaves after cooking. 2. Drinking water filtrate.	3 times /day	upon request
			4	Abdomen pain	Leaves chipped, washed squeezed and then cooked with onion and oil	Eating leaves after cooking.	Once / day	1-2 days
			9	Treatment for urinary tract disease	Leaves chipped, washed squeezed and then cooked with onion and oil and oil).	Drinking	Twice/ day	One week
			14	Diabetes	Leaves chipped, washed squeezed and then cooked with onion and oil.	Eating leaves after cooking.	once /month	up request
			1	Hemorrhoids	Dried Leaves soaked for 15 minutes then cooked	Eating leaves after cooking.	3 times /day	2 weeks
			2	Constipation	Leaves cut and then cooked with onion and oil.	Eating leaves after cooking.	Once/ day	3 days
			12	Activates the circulatory system and produces milk	Leaves cut and then cooked with onion and oil.	Eating leaves after cooking.	Twice/ day	2 days
			1	Stomach pain	Dried Leaves soaked for 15 minutes then cooked.	Eating leaves after cooking	3 times /day	One week

Asparagus aphyllus	Prickly asparagus	هليون	2	Infections	Eating the leaves after cooking them	Eating leaves after cooking	Twice/ day	3 days
Ceratonia siliqua	Carob	خروب	1	Infections	Fruits squeezed	Drinking the juice	One cup / day	One week
Cichorium pumilumjacq.	Dwarf Chicory	علت	11	Infections	Leaves cooked with oil and onion or boiled with water.	Eating leaves after Cooking or drinking the filtrate	Once/ day	One week
			2	Strengthen blood	Leaves soaked in hot water.	Eating leaves after cooking.	Once/ day	One week
			1	Abdominal pain	Leaves cooked with oil and onion	Eating leaves after cooking.	Twice/ day	3 days
Coridothymus capitatus	Capitate Thyme	زعتر فارسي	1	Teeth pain	Five gm of leaves boiled in water.	Mouthwash with filtrate	3 times /day	1-2 days
			9	Abdominal pain	Foliage soaked in boiled water for 10 minutes.	Drinking filtrate	3 times /day	One day
			4	Cold	Leaves boiled in water.	Drinking water filtrate.	3cups/ day	3-4 days
			7	Joint pain	Foliage boiled.	Drinking water boiled in Capitates Thyme leaves.	Twice/day	upon request
			7	Steady nerves	Foliage boiled.	Foliage (Drinking boiled water)	Once cup/day	upon request
Crataegus aronia	Spiny hawthorn	زعرٍور	5	Inflatable abdomen	Leaves, (boiling the leaves).	Drinking the water where leaves boiled.	2 cups / day	One week

Cyclamen persicum	Cyclamen	زعمطوط	5	Hemorrhoids	Tuber boiled with water.	Rubbing on pain place.	3 times /day	2 Weeks
Eruca sativa	Watercress	جرجير	6	Infections and urinary tract	Leaves eaten raw.	Eating fresh leaves	Twice/ day	3 days
			1	Joint treatment	Leaves squeezed leaves then oil, extracted.	Anointment on pain place.	Twice/ day	3 days
			5	Sexual stimulants	Leaves eaten raw.	Eating fresh leaves	Twice/ day	3 days
			1	Diabetes	Leaves eaten raw.	Eating fresh leaves	3 times /day	One day
Foeniculum officinale	Sweet fennel	شومر	2	Inflatable abdomen	Seeds boiled in water.	Drinking one cup after boiled.	Once/ day	One week
			2	Prevents thirst for children and sugars compensated for children	Leaves chipped n grinded, and melted it in a cup of boiled water.	Drinking a cup of Fennel grinding leaves after boiling in water.	2-3 times / day	3 days
			3	Chest pain and cuaght	Seeds soaked in boiled water.	Drinking one cup after boiling in water	3 times /day	3-4 days
			1	Steady nerves	Leaves soaked in cold water.	Drinking filtrate	Once/ day	upon request
Gageachlorantha	Gagea	زعيتمان	10	Chest pain	30 gm foliage boiled in 2 liters in water.	Drinking one cup	2-3 times/ day	3 days

			4	Repellent worms	Leaves boiled in water.	Drinking a cup of the filtrate	One cup/ day	3-4 days
			9	Abdominal pain	Foliage boiled in water.	Drinking the filtrate	2 cups/ day	One day
Majorana syriaca	Wild thyme	زعتر بري	3	Teeth pain	Five gm of leaves boiled with water.	Mouthwash with filtrate	3small cups/day	1-2 days
			23	Stomach pain	30 gm of foliage boiled in n 2 liters of water).	Drinking a cup of thymes after boiling.	2-3 times/day	3 days
			28	Cleaning the urinary tract	Boiled foliage drunk.	Drinking a cup of thyme after boiling.	Once / early morning	One week
			77	Pain in the chest and the crisis	30 gm of thyme' leaves boiled in 2 liters of water, or inhalation of the evaporated smoke of boiling leaves	Drinking water boiled with the leaf,or smell the evaporated smoke coming from boiling leaves with water.	2-3 times/ day	One week
			17	Cold	Thirty gm of foliage of thymes boiled in 2 liters water.	Drinking a cup of boiled thyme	2-3 times/ day	3 days
			2	Kidney sands	Ten gm of leaves boiled in 500 ml of water.	Drinking a cup of thyme	2cups/ day	3 days

			1	To cough and colon	30 gm of thyme' leaves boiled in 2 liters of water	Drinking a cup of thyme	2-3 times / day	3 days
			1	Romatizims	Leaves soaked then made stupid.	Making stupe from soaked cold water leaves then putting it on pain areas.	Twice/ day	upon request
Malva sylvestris	Common mallow	خبيزة	7	Help digestion	Leaves chipped and cooked.	Eating leaves after cooking them then drinking the filtrate	Once/day	3days
			4	Burns	Foliage consumed fresh	Placing the leaves on the injured area twice a day	Twice/day	3 days
			3	Cold	Leaves boiled in water.	Drinking a boiled water of Common mallow.	Once/day	3 days
			6	Dimples or coincidences in the feet	Leaves grinded.	Placing the leaves after grinding on the injured place then tiding it with a piece of texture.	Twice/day	One week

			1	skin	Leaves boiled in water.	Washing face using water where leaves were boiled	Twice/day	One week
			13	infections	Leaves boiled in water.	Using the leaves boiled water for bathinette pour 2 drops of the filtrate in infected ear	Twice/day	One week
			1	Diabetes	Leaves cooked with oil and onion.	Eating leaves after cooking .	Once/day	3 days
			3	Kidney	Leaves cooked with oil and onion.	Eating leaves after cooking .	Twice/day	One week
Matricaria aurea	Golden cotula	بابونج	1	Allergy	Flowers boiled in water.	Washing the place injured using the water where flowers were boiled.	Once/day	One month
			31	Stomach pain and diharria	Flowers soaked in boiled water for 10 minutes.	Drinking a cup of water	Twice/day	One day
			10	crises Chest	Flowers soaked in boiled water for 10 minutes	Drinking a cup of water	3 times /day	One day

			5	Dental pain	Flowers soaked in boiled water for 10 minutes	Mouthwash with the filtrate.	Twice/ day	One week
Mentha longifolia	Horse mint	نعنع بري	3	Opens brounches	Drinking a cup of water & tea where leaves were soaked.	Drinking a cup of water & tea where leaves were soaked.	Twice /day	3-4 days
Mentha spicita	*Mint*	نعنع	14	Stomach pain	Foliage soaked in boiled water for 10 minutes.	drinking a cup of the filtrate	Twice/ day	One day
			8	Chest pain caught	Leaves soaked in boiled water).	Drinking the filtrate	Twice/ day	One week
			2	infections	Leaves soaked in boiled water.	Drinking the filtrate	Twice/ day	2weeks
Micromeria fruticosa	Thyme	زعتر بلاط	3	Stomach pain	Leaves soaked in hot water for 10 minutes.	Drinking the water where leaves boiled	Once /day	1-2 day
			2	Treatment Laundries	Leaves boiled.	Placing the Thyme leaves on burn ironed places.	Twice/ day	3 days

Nigella ciliaris	Nigella, black common	حبة البركة	6	Blood weakness and faint	Eating from the mixture	Eating from the mixture	Once/ day	One week
			2	Diabetes	Drinking filtrate	Drinking filtrate	Once /day	upon request
			1	Sexual weakness	Eating honey seed mixture.	Eating honey seed mixture.	Once /day	upon request
			2	Nerves	Eating stems raw.	Eating stems raw.	Once /day	upon request
			8	Diabetes	Eating fresh leaves	Eating fresh leaves	Once/da y	upon request
Rosemary	Rosmarin us officinalis	حصالبان	3	Stomach pain	Foliage soaked in boiled water for 10 minutes.	Drinking one cup after boiled.	Twice/ day	One day
			6	Infections	Foliage soaked in boiled water for 10 minutes.	Drinking a cup filtrate	2 cups/ day	All the year
			6	Heart disease	Foliage soaked in boiled water for 10 minutes.	Drinking a cup filtrate	2 cups/ day	All the year
Salvia fruticosa	White sage, Common sage,	ميرمية	4	Chest pain	Foliage soaked it for 10 minutes.	Drinking	3-4 times/da y	One week
			7	Colon treatment	Foliage soaked it for 10 minutes in hot water.	Drinking water soaked foliage.	3 times /day	One day
			3	Burns	Leaves cooked with olive oil.	Place on pained place.	Twice/ day	3 days

			7	Teeth pain	5 gm of leaves boiled with water.	Mouthwash with the filtrate.	Small cup (3times/ day)	1-2 days
			4	Heart diseases	Foliage soaked in hot water for 10 minutes.	Drinking	Twice/ day	upon request
			69	Stomach pain and diarrhea	Foliage soaked in hot water for 10 minutes).	Drinking a cup of White sage 3 time/day	Twice/ day	3 days
			3	stop bleeding	Fresh foliage.	Placing leaves at the injured place	Twice/ day	upon request
			2	Ears pain	Foliage soaked in hot water for 10 minutes	Administering 2 dropsof the cool filtrate into ear.	2 drop/day	One week
Silybum marianum	Holy thistle	سنارية	1	Gingivitis	Leaves cooked.	Mouth wash	Twice /day	3 days
			1	Alaregy resistance	Stem cooked.	Eating stems after cooked.	Twice /day	upon request
			2	treatment of stomach	Leaves boiled in water.	Drinking a cup of water after boiling leaves inside it.	Twice /day	upon request
Teucrium polium.	Cat thyme	جعدة	3	Stomach pain	Leaves cooked with oil and onion.	Eating	Twice/ day	2 days

			1	Joint infection	Leaves squeezed.	Placing sappiness on the place of pain	Twice/ day	One month
			7	Infection and diarrhea	Leaves cooked with oil and onion.	Eating leaves after cooking.	Twice/ day	One week
			2	cancer	Leaves eaten fresh.	Eating the fresh leaves	3-4 times/ day	upon request
			7	Infections	300 gm of foliage in 2 litters of water.	Drinking water soaked in leaves	One cup/ day	One week
Fenugreek seed	*Trigonella foenum-graecum*	حلبة	11	Internal Infections	30gm of seeds boiled in water	Drinking small boiled cup after being cooled.	Small one cup/ day	One week
			4	Abdominal pain	Seeds soaked then boiled in water.	Drinking the filtrate	Once/ day	upon request
			1	Strengthen blood	Seeds soaked in cold water then filtrated..	Drinking small cup	Once/ day	One month
			3	Legs pain	30 gm of seeds boiled in water .	Soaking feet in seed's cooked water	Once/ day	3-4 days
			3	To Strengthen the blood and faint	Seeds soaked then boiled in water.	Drinking small cup	Once/ day	2 weeks

			4	Diabetes	Seeds boiled.	Drinking small cup	One cup/ day	upon request
			3	liver disease	Seeds soaked in hot water.	Drinking small cup	2 cups/ day	One week
Urtica pilulifera	Roman Nettle	قريص	1	Revitalization of the body	Seeds boiled with water.	Drinking on empty stomach	A cup /day	One week
			2	Allergy and burn	Leaves boiled with water.	Drinking water boiled with the leaf., or rubbing the area using boiled leaves.	Twice/ day	One week
			3	Joint pain	Leaves boiled with water.).	Drinking water boiled with the leaf.	Twice/ day	One week
			1	Nerves	Leaves (using fresh leaves).	Eating fresh leaves	Once/ day	upon request
			1	Sensitivity	Fresh leaves consumed.	Placing fresh leaves on allergic area directly.	Once/ day	upon request

Appendix G

Photos of some of the reported plants.

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*1:Teucrium polium, 2: Majoranasyriaca, 3: Coridothymus capitatus, 4:Salvia fruticosa, 5:Sinapis arvensis, 6: Eryngium creticum,7: Rosmarinus officinalis, 8: Crataegus aronia, 9: Ficus sycomorus 10 :Arum palaestinum, 11:Centaurea dumulosa, 12: Prunus mahaleb.(*www.bercc-taphm.com**)**

جامعة النجاح الوطنية
كلية الدراسات العليا

دراسات في النباتات البرية التي تؤكل في شمال الضفة الغربية

إعداد
ندين صادق عبد الله حناوي

إشراف
أ.د. محمد سليم اشتية

قدمت هذه الأطروحة إستكمالا لمتطلبات الحصول على درجة الماجستير في العلـــوم البيئيـــة بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.
2010

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الملخص

أجريت هذه الدراسة مابين شباط للعام 2007 وحتى شهر آب للعام 2007 في شمال الضفة الغربية والتي شملت ست محافظات (نابلس، طولكرم ، قلقيلية، جنين، طوباس، سلفيت). وهي ضمن منطقة البحر الأبيض المتوسط والتي تتميز بالتنوع الحيوي والجغرافي. تقع هذه المنطقة في مناطق شبه ساحلية ومناطق جبلية مرتفعه والتي تتميز باعتدال الطقس فيها.

هدفت الدراسة الحالية لإجراء مسح للنباتات البرية التي تؤكل في محافظات شمال الضفة الغربية في فلسطين .وكذلك إلى توثيق المعارف الأصلية اثنوبتانية المتصلة باستخدام أنواع النباتات البرية الصالحة للأكل وتقييم التهديدات القائمة على هذه النباتات والتعرف على استخدام هذه النباتات، والتعرف على الوضع القائم وطرق حفظ وخزن هذه النباتات، بالإضافة إلى ذلك بحثت الدراسة إلى نشاط نبات الزعتر ضد الأكسدة باستخدام DPPH and β-carotene.

جمعت المعلومات من 215 شخص في 39 قرية في مواقع مختلفة فبلغ عدد النباتات 58 نوع صنفت ما بين 22 عائلة و 55 جنس ، تسعة وأربعون من هذه النباتات ذكرت من قبل 3 أشخاص فما فوق ، وزعت عبر 20 عائلة و 46 جنس.

فكانت معظم النباتات المستخدمة على نطاق واسع هي :

(Majorana syriaca, Malva neglecta, Salvia hierosolymitana, Cyclamen persicum, Gundelia tournefortii , Coridothymus capitatus, Mentha spicata, Cichorium pumilumjacq, Teucrium polium, Arum palaestinum).

وبناءا على للأنواع أشارت الدراسة إلى أن *Majorana syriaca* بالمرتبة رقم واحد حيث بلغ متوسط استخدامه إلى 1.97 بينما تراوحت في مجموعة أخرى متوسط استخدامها ما بين 0.9-0.5 وهي تشمل:

Arum palaestinum, Centaurea dumulosa, Cichorium pumilumjacq, Gageachl orantha, Gundelia tournefortii, Malva sylvestris Matricaria aurea, Rumex acetosa, and Rumex Patientia, Salvia fruticosa, Salvia hierosolymitana, and Teucrium polium.

بناءا على حساب معامل الأهمية الثقافية لدى العائلات تبين أن عائلة Labiaetae كانت الأكثر أهمية حيث بلغ متوسط الأهمية الثقافية لها 4.9 أما بقية العائلات فكان متوسط معامل الأهمية الثقافية لها على االنحو التوالي:

Asteraceae (3.19), Polygonaceae (1.64), Araceae (.926), Primulaceae (.92) and Brassicaceae with (.81).

كما أظهرت الدراسة إلى نشاط المضادات للأكسدة في *Majorana syriaca* حيث أن المستخلص أظهر تثبيط 50% من امتصاص DPPH، ومجموع مركبات الفينول الموجودة في مستخلص ايثنول الزعتر (37.3µg mg-1 pyrocatechol equivalent) ومجموع مركبات flavonoids (146µg mg-1 quercetin).

مما يدل على أهمية نبات الزعتر لاحتوائه على مضادات الأكسدة التي تمنع عملية الأكسدة في خلايا جسم الانسان، التي تسبب العديد من الأمراض وأهمها مرض السرطان.

بغض النظر عن عدد كبير من الأنواع النباتية وذكرت واستخداماتها في كل من الغذاء والدواء ، وأظهرت الدراسة الحاجة لحماية هذه الأنواع. وبالإضافة إلى ذلك ، هناك حاجة إلى دراسة الآثار الجانبية على صحة الإنسان.