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Ethnobotanical Study of Edible Wild Plants in Libya

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ABSTRACT

This study was designed to document the use and conservation of edible wild plants in Libya. Data were collected through semi-structured interviews and focus group discussions. A total of 145 edible wild plant species were identified; of these, herbs represented the majority with 119 species. Regarding the parts used, the most consumed parts were leaves (in 64 species), followed by young shoots (in 39 species), fruits (in 35 species), seeds (in 16 species), flowers and roots (in 14 species each), and 8 species were consumed as a whole plant. Studies on the mode of consumption revealed a total of 12 ways of consumption, of which the majority were consumed raw (90 species), followed by consumption after cooking (56 species) and as a salad (41 species).

KEYWORDS

ethnobotany, edible, rural, raw, cooked, flora.

INTRODUCTION

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 the deep wilderness (Hinnawi, 2010; Kallas, 1996).

Indigenous people living in particular areas depend on the use of wild plants or plant parts to fulfill their needs and often have considerable knowledge of their uses. The people generally depend on the nearby forest areas to obtain their needs (Acharya and Acharya, 2010).

Wild plants, aside from being used by poor communities, are commonly used today as a supplement for healthy diets in even the most developed regions of the world (Redzic, 2006). Approximately 75,000 species of plants worldwide are believed to be edible (Walters and Hamilton, 1993); among them, more than 7,000 species are grown in the wild and have been used for human food at some period throughout the history of humans. They have a prominent role in both early and contemporary societies (Carvalho and Barata, 2017). Over the centuries, people have been dependent on this resource for their subsistence as they are efficient and cheap sources of several important micronutrients (Ali and Tsou, 1997). It has been even suggested that wild food plants are nutritionally superior to some of the cultivated ones (Burlingame, 2000).

Millions of people in many developing countries do dominate within the investigated area for the benefits of not having enough food to meet their daily requirements, and furthermore, people are deficient in one or more micronutrients. Thus, in most cases, rural communities depend on wild resources including wild edible plants to meet their food needs in periods of food crisis (Al – Qura'n, 2010).

Edible wild plants include food categories familiar to everyone: root vegetables (including true roots and underground storage organs like bulbs, corms, tubers, and rhizomes); edible greens (leaves, stems, shoots, including marine algae);

fleshy fruits (berries, pomes, drupes); and grains, seeds, and nuts. Other edible products include the inner bark and cambium of trees, plant-based beverages, plants used for flavoring, and edible wild mushrooms and lichens. Many of these wild foods are common and productive, as well as highly nutritious, palatable, and easily harvested. Some, such as *Rubus* spp. (raspberry relatives) and *Rosa* spp. (wild roses), yield more than one type of food (in these cases, both edible fruits and edible green shoots) (FAO, 1988; Kuhnlein et al., 2009; Turner et al., 2011; Walsh, 2009).

In Libya, most of the rural people still consume wild plants as their routine food and use them especially in preparing their traditional meals, even though attention for this tradition has declined with time due to civil development and prosperity. Therefore, this survey was conducted to highlight the importance of wild plants in providing food value as a source of vitamins, carbohydrates, proteins, and microelements and food security as well, especially for poor people as a food complement, and also to refresh the heritage memory regarding edible wild plants for people belonging to new generation.

1. METHOD

This study was designed to conduct a taxonomic survey of edible wild plant species distributed in the rural areas of Libya with their relevant names and to identify the edible form, life forms, the part used, way of consumption, and other uses.

Ethnobotanical Data Collection. Many informants, both males and females of different age groups, were chosen from several villages (rural districts) around Tripoli and were asked about the consumption of wild foods in order to gain insight into their present-day use, ways of consumption and preparation, the time of collection, and the places where each species was gathered. The ages of the informants were between 35 and 80 years. Semi-structured interviews, field observation, and focus group discussions were employed for data collection. Focus group discussions were employed for investigation of edible wild plants in order to help in comparison of patterns evident among individual interviews and to reject contradictory information. More data about the parts used and the ways of consumption of edible wild plants were also collected from the following literature reviews about edible wild plants (Al – Qura'n, 2010; Andelson et al., 2011; Berihun and Molla, 2017; Ferriera et al., 2017; Hinnawi, 2008 ; Khan et al., 1017; Ludwig et al., 2009; Manuel et al., 2006; Polat et al., 2015; Turner et al., 2010, 2011).

Data Analysis. Descriptive statistics were used to analyze the ethnobotanical data of the reported edible wild plants and their associated indigenous knowledge. Life form spectrum of surveyed plant species, number of used parts, and mode of consumption were analyzed to find the ethnobotanical importance of the edible wild plants in Libya.

2. RESULTS

A total of 145 edible wild plant species belonging to 111 genera and 47 families were recorded in this survey, of which 39 families belonged to dicotyledons, 5 families were monocotyledons, and 2 families belonged to gymnosperms and 1 was of fern family. Out of the 47 documented families, Asteraceae and Fabaceae were the dominant ones, which were represented by 18 species each, followed by Brassicaceae with 14 species, Polygonaceae with 8 species, and then Apiaceae with 7 species. The genus *Rumex* was dominant with six species, followed by the genus *Vicia* with five species, the genera *Amaranthus* and *Lathyrus* with four species each, and *Urtica* with three species. The rest were represented either by two or one species each. Herbs accounted for the highest number of consumed plants and formed 119 species; the rest consisted of 10 trees species, 15 shrubs, and 1 climber species) Table 1).

Life form analysis revealed that the majority of consumed species were herbs which were represented by 119 species; the rest consisted of 10 tree species, 15 shrubs, and 1 climber species.

Regarding the parts used, a total of seven edible parts were recorded. Of these, leaves were consumed in 64 species (34.2%), young shoots in 39 species (20.9%), fruits in 35 species (18.9%), flowers in 14 species (7.5%), roots in the same number of species, seeds in 13 species (7.00%), and finally 8 species were consumed as a whole plant (4.3%) (Tables 1 and 2; Figure 1). Moreover, more than one part of several species can be consumed in different ways (e.g., in *Pinus halepensis*, the shoots can be eaten raw, in a salad, or fried with oil, mustard, onion, salt, pepper, and other flavoring spices; leaves are boiled in water and used as a substitute for tea; male cone can be eaten raw; and seeds can be eaten raw or as a spice for flavoring meals).

As regards the mode of consumption, a total of 12 ways of consumption were recorded, of which the majority (90 species; 35.7%) were consumed raw, followed by cooking (56 species; 22.2%) and as a salad (41 species; 16.2%). The rest of the consumption modes are shown in Table 3 and Figure 2. Moreover, many species were reported to be consumed in different ways; for example, the leaves of *Cardamine hirsuta* can

Table 2. *Number and percentage of the parts used*

Part used	No. of species	%
Leaves	64	34.2
Young shoots	39	20.9
Fruits	35	18.9
Roots	14	7.5
Flowers	14	7.5
Seeds	13	7.0
Whole plant	8	4.3

Table 1. List of studied edible plants with the parts used and the mode of consumption

No.	Family	Scientific name	Part used	Mode of consumption
1	Adiantaceae	*Adiantum capillus-veneris* L.	Young leaves	Eaten as salad or cooked as vegetables
2	Alliaceae	*Allium ampeloprasum* L.	Whole plant	Eaten raw in a salad or cooked with meals
3	Alliaceae	*Allium roseum* L.	Whole plant	Cooked with meals as vegetables
4	Amaranthaceae	*Amaranthus hybridus* L.	Young leaves	Cooked with meals as vegetables
5	Amaranthaceae	*Amaranthus retroflexus* L.	Leaves	Cooked with meals as vegetables
6	Amaranthaceae	*Amaranthus spinosus* L.	Young shoots and leaves	Eaten raw in a salad or fried in oil
7	Amaranthaceae	*Amaranthus viridis* L.	Young shoots and leaves	Eaten raw in a salad or cooked with meals as vegetables
8	Amaryllidaceae	*Pancratium maritimum* L.	Roots	Roasted or cooked
9	Anacardiaceae	*Rhus coriaria* L.	Flowers, fruits, seeds	Eaten raw; ground and roasted to make jam
10	Anacardiaceae	*Pistacia atlantica* Desf.	Young leaves, fruits	Leaves eaten as a salad mixed with yoghurt, fruits eaten raw
11	Anacardiaceae	*Pistacia lentiscus* L.	Young leaves, fruits	Leaves eaten as a salad mixed with yoghurt, fruits eaten raw
12	Apiaceae	*Ridolfia segetum* (Guss.) Moris	Leaves and young shoots	Eaten raw or used in soup flavoring
13	Apiaceae	*Ammi majus* L.	Young shoots	Eaten raw
14	Apiaceae	*Apium nodiflorum* (L.) Lag.	Whole plant	Eaten raw or with salad
15	Apiaceae	*Crithmum maritimum* L.	Leaves	Eaten in salad
16	Apiaceae	*Daucus carota* (Lam.) Hook.	Roots and seeds	Eaten raw, cooked, dried, and roasted
17	Apiaceae	*Eryngium campestre* L.	Tuberous roots	Eaten as salad and potion
18	Apiaceae	*Smyrnium olusatrum* L.	Young braches	Raw in salad
19	Asteraceae	*Bidens pilosa* L.	leaves	Cooked with meals
20	Asteraceae	*Chamomilla aurea* (Loefl.) Gay ex Cossom & Kralik	Shoots and flowers	Boiled in water to make tea
21	Asteraceae	*Chrysanthemum coronarium* L.	Young stems after removing leaves	Eaten raw
22	Asteraceae	*Cichorium pumilum* Jacq.	Young leaves	Eaten as a salad or cooked as a vegetable dish
23	Asteraceae	*Cichorium intybus* L.	Roots	Dried and ground roots blended with coffee
24	Asteraceae	*Cynara cardunculus* L.	Leaves and hypanthium	Raw or cooked with meals
25	Asteraceae	*Helianthus tuberosus* L.	Tubers	Eaten raw, roasted, fried, or dried and ground to make bread

No.	Family	Scientific name	Part used	Mode of consumption
26	Asteraceae	*Lactuca serriola* L.	Leaves	Raw in salad
27	Asteraceae	*Notobasis syriaca* (L.) Cass.	Leaves and young shoots	Eaten raw or cooked with meals
28	Asteraceae	*Rapontícum aquale* L.	Hypanthium	Eaten raw
29	Asteraceae	*Reichardia picroides* (L.) Roth.	Leaves	Eaten raw in salads or cooked
30	Asteraceae	*Scolymus hispanicus* L.	Young shoots	Eaten raw, midribs boiled and eaten as artichokes
31	Asteraceae	*Scorzonera hispanica* L.	Roots	Eaten raw
32	Asteraceae	*Scorzonera undulata* Vahl.	Roots	Eaten raw
33	Asteraceae	*Silybum marianum* (L.) Gaertner	Roots, leaves, young shoots, heads	Roots eaten raw or boiled, arial parts eaten raw or cooked
34	Asteraceae	*Sonchus asper* (L.)Hill	Leaves	Leaves boiled in “pistic” blend
35	Asteraceae	*Sonchus oleraceus* L.	Leaves	Eaten in salad
36	Asteraceae	*Tarxacum offiicinalis* (L.) Weber ex Wigg	Whole plant	Eaten raw, fried, or dried and roasted
37	Boraginaceae	*Borago officinalis* L.	Young leaves and flowers	Young leaves eaten in salad or fried Flowers used to flavor juices
38	Brassicaceae	*Brassica tournefortii* Goun.	Vegetative part	Cooked with meals
39	Brassicaceae	*Capsella busa-pastoris* (L.) Medikus	Whole plant	Eaten raw or cooked, dried and ground to use as a spice instead of pepper
40	Brassicaceae	*Cardamine hirsuta* L.	Leaves	Eaten raw, in a salad, cooked with vegetable meals
41	Brassicaceae	*Cardaria draba* (L.) Desv.	Seeds	Hot spice
42	Brassicaceae	*Diplotaxis acris* (Forsk.) Boiss.	Leaves	Eaten raw, in salad
43	Brassicaceae	*Eruca sativa* L.	Leaves	Eaten raw, in salad
44	Brassicaceae	*Lepdium sativum* L.	Young leaves and seeds	Leaves eaten raw, in a salad, or cooked with meals Seeds used as a hot spice
45	Brassicaceae	*Lepidium latifolium* L.	Young leaves	Eaten as salad mixed with yoghurt
46	Brassicaceae	*Nasturtium officinale* R.Br.	Vegetative parts	Eaten in salad
47	Brassicaceae	*Raphanus raphanistrum* L.	Vegetative parts	Eaten raw
48	Brassicaceae	*Sinapis alba* L.	Young stems and leaves	Eaten raw as a salad mixed with yoghurt, cooked as vegetable

No.	Family	Scientific name	Part used	Mode of consumption
49	Brassicaceae	*Sinapis arvensis* L.	Young stems and leaves	Eaten raw as a salad mixed with yoghurt, cooked as vegetable
50	Brassicaceae	*Sisymbrium irio* L.	Young shoots and leaves	Eaten raw, in a salad mixed with yoghurt
51	Brassicaceae	*Sisymbrium officinale* (L.) Scop.	Young shoots and leaves	Cooked as vegetables
52	Cactaceae	*Opuntia ficus-indica* (L.) Mill.	Fruits	Raw and juice
53	Caesalpiniaceae	*Ceratonia siliqua* L.	Fruits	Raw and juice
54	Capparaceae	*Capparis spinosa* L.	Fruits	Vinegar and spice
55	Caryophyllaceae	*Gypsophila elegans* Bieb.	Roots	Dried, ground, and used to make sweets (halawa)
56	Caryophyllaceae	*Silene vulgaris* (Moench) Garcke	Leaves	Eaten raw or cooked as a vegetable in meals
57	Caryophyllaceae	*Stellaria media* (L.) Vill	Whole plant	Eaten raw, in salad, or cooked in meals
58	Chenopodiaceae	*Atriplex halimus* L.	Leaves	Eaten in salad or cooked in meals
59	Chenopodiaceae	*Chenopodium album* L.	Shoots, seeds	Shoots eaten raw in a salad Seeds ground to make bread
60	Chenopodiaceae	*Chenopodium murale* L.	Shoots, seeds	Shoots eaten raw in a salad Seeds ground to make bread
61	Cucurbitaceae	*Citrullus colocynthis* (L.) Schrader	Seeds	Eaten raw, roasted, boiled in water
62	Cupressaceae	*Juniper oxycedrus* L.	Young shoots, fruits, seeds	Shoots boiled to make tea, fruits eaten raw or used as a spice Seeds used a substitute for coffee
63	Cupressaceae	*Thuja occidentalis* L.	Leaves	Boiled in water, used as a substitute for tea
64	Cyperaceae	*Cyperus esculentus* L.	Fruits, tubers	Fruits sweet, eaten raw Tuber eaten raw or boiled or cooked or used as a spice or a substitute for coffee
65	Cyperaceae	*Cyperus longus* L.	Fruits, tubers	Fruits sweet, eaten raw Tuber eaten raw or boiled or cooked or used as a spice or a substitute for coffee
66	Elaeagnaceae	*Elaeagnus angustifolia* L.	Fruits	Eaten raw, used to make jam
67	Erecaceae	*Arbutus pavarii* Pam.	Fruits	Eaten raw, used to make jam
69	Fabaceae	*Anthyllis vulneraria* L.	Young shoots	Cooked as a vegetable
68	Fabaceae	*Lathyrus cicera* L.	Fresh fruits	Eaten raw

No.	Family	Scientific name	Part used	Mode of consumption
70	Fabaceae	*Lathyrus gorgoni* Parl.	Fresh fruits	Eaten raw
71	Fabaceae	*Lathyrus ochrus* (L.) DC	Fresh fruits	Eaten raw
72	Fabaceae	*Lathyrus pseudocicera* Pamp.	Fresh fruits	Eaten raw
73	Fabaceae	*Medicago orbicularis* (L.) Bartal.	Fruits	Eaten raw
74	Fabaceae	*Onobrychis caput-galli* (L.) Lam.	Fresh fruits	Eaten raw
75	Fabaceae	*Onobrychis crista-galli* (L.) Lam.	Fresh fruits	Eaten raw
76	Fabaceae	*Ononis spinosa* L.	Young shoots	Eaten raw or cooked
77	Fabaceae	*Psoralea bituminosa* L.	Young shoots	Cooked as a vegetable
78	Fagaceae	*Quercus ruber* L.	Fruits	Eaten roasted, ground to make bread and cakes, substitute for coffee
79	Fabaceae	*Tetragonolobus purpureus* Moench.	Pods	Eaten raw or cooked
80	Fabaceae	*Trigonella stellata* Forsk.	Seeds	Dried and ground and used to flavor vegetable ghee
81	Fabaceae	*Vicia hybrida* L.	Fresh pods	Eaten raw
82	Fabaceae	*Vicia narbonensis* L.	Fresh pods	Eaten raw
83	Fabaceae	*Vicia peregrina* L.	Fresh pods	Eaten raw
84	Fabaceae	*Vicia sativa* L.	Fresh pods	Eaten raw
85	Fabaceae	*Vicia villosa* Roth.	Seeds	Raw or cooked with meals
86	Fumariaceae	*Fumaria officinales* L.	Leaves	Eaten raw
87	Geraniaceae	*Erodium gruinum* (L.) L'Her.	Leaves	Eaten raw
88	Geraniaceae	*Geranium tuberosum* L.	Roots	Eaten raw or roasted
89	Lamiaceae	*Calamintha incana* (Sm.) Heldr.	leaves and shoots	Eaten raw or consumed as tea
90	Lamiaceae	*Mentha longifolia* (L.) Hudson	Young shoots, leaves	Eaten raw or cooked
91	Lamiaceae	*Rosmarinus officinalis* L.	Leaves and flowers	Spice to flavor meat, pizza, and so on
92	Lamiaceae	*Sideritis montana* L.	Young shoots	Substitute for tea
93	Lamiaceae	*Thymus capitatus* (L.) Hoff.m	Leaves and flowers	Spice to flavor meat, pizza, tea, and so on
94	Lauraceae	*Laurus nobilis* L.	Leaves	Spice for flavoring meals

No.	Family	Scientific name	Part used	Mode of consumption
95	Liliaceae	*Agave* sp.	Flowers and flowering buds	Consumed after boiling in water
96	Liliaceae	*Asparagus aphyllus* L.	Young shoots	Cooked as a vegetable dish or in soup
97	Liliaceae	*Asphodelus microcarpus* L.	Tubers	Dried and ground and used for the preparation of mush and bread
98	Liliaceae	*Muscari comosum* L.	Bulbs	Fried or cooked with meals
99	Liliaceae	*Smilax aspera* L.	Young shoots	Cooked as a vegetable in meals
100	Malvaceae	*Alcea rosea* L.	Flowers	Boiled in water to make sweet juice
101	Malvaceae	*Malva nicaeensis* All.	Leaves and fruits	Leaves cooked with meals Seeds eaten raw
102	Malvaceae	*Malva parviflora* L.	Leaves and fruits	Leaves cooked with meals Seeds eaten raw
103	Malvaceae	*Malva sylvestris* L.	Leaves and fruits	Leaves cooked with meals Seeds eaten raw
104	Mimosaceae	*Acacia farnesiana* (L.) Wild.	Young shoots, flowers, pods	Eaten raw or cooked with meals
105	Mimosaceae	*Acacia nolotica* (L.) Delile.	Seeds	Eaten roasted
106	Myrtaceae	*Myrtus communis* L.	Fruits	Fruits sweet, eaten raw
107	Myrtaceae	*Syzygium guineense* (Willd.) DC.	Fruits	Eaten raw
108	Orobanchaceae	*Cistanche violacea* (L.) Ruj.	Fleshy roots	Eaten raw
109	Oxalidaceae	*Oxalis corniculata* L.	Young shoots, leaves	Eaten raw or in salad
110	Oxalidaceae	*Oxalis pes-caprae* L.	Young shoots, leaves	Eaten raw or in salad
111	Papaveraceae	*Papaver rhoeas* L.	Flowers	Cooked with eggs as a vegetable
112	Papaveraceae	*Glaucium corniculatum* (L.) Ruj	Leaves and seeds	Leaves cooked with meals Seeds eaten raw
113	Pinaceae	*Pinus halepensis* Mill.	Young shoots and leaves, male cones, seeds	Shoots eaten raw, in salad, or fried Leaves used as a substitute for tea Male cone eaten raw Seeds eaten raw or as a spice
114	Plantaginaceae	*Plantago major* L.	Young leaves, seeds	Leaves eaten raw or cooked in meals Seeds ground to make bread and cakes

No.	Family	Scientific name	Part used	Mode of consumption
115	Poaceae	*Phragmitis australis* (Car.) Train.	Whole plant	Young shoots eaten with salad Rhizome boiled and eaten or ground to make bread
116	Poaceae	*Saccharum officinarum* L.	Stem	Pith eaten raw or used to make a sweet juice
117	Poaceae	*Setaria* sp.	Seeds	Eaten raw or boiled
118	Poaceae	*Sorghum halepensis* (L.) Peas.	Seeds	Eaten raw or cooked
119	Polygonaceae	*Calligonum comosum* L'Her.	Young flowers	Eaten raw
120	Polygonaceae	*Emex spinosus* (L.) Camp.	Leaves	Eaten in salad
121	Polygonaceae	*Rumex acetosa* L.	Stem and leaves	Eaten raw or in salad, or cooked with meals
122	Polygonaceae	*Rumex crispus* L.	Leaves and young shoots	Eaten raw, cooked, or used in dough stuffing
123	Polygonaceae	*Rumex pictus* Forssk	Leaves	Eaten raw with salad or cooked with meals
124	Polygonaceae	*Rumex pulcher* L.	Leaves and young shoots	Eaten raw, cooked, or used in dough stuffing
125	Polygonaceae	*Rumex tingitanus* L.	Leaves	Eaten raw with salad or cooked with meals
126	Polygonaceae	*Rumex vesicarius* L.	Whole young plant	Eaten raw with salad or cooked with meals
127	Portulacaceae	*Portulaca oleracea* L.	Leaves	Eaten raw with salad or cooked with meals
128	Ranunculaceae	*Ranunculus ficaria* L.	Leaves	Eaten raw or cooked as a vegetable dish
129	Ranunculaceae	*Ranunculus muricatus* L.	Young shoots	Eaten raw, as a salad, or cooked as vegetable dish
130	Resedaceae	*Ochradenus baccatus* Delile.	Fruits	Fruits sweet, eaten raw
131	Rhamnaceae	*Zizphus lotus* (L.) Lam.	Fruits	Fruits sweet, eaten raw
132	Rhamnaceae	*Ziziphus spina-christi* (L.).Willd.	Fruits	Fruits sweet, eaten raw
133	Rosaceae	*Crataegus* sp.	Young leaves, flowering buds, fruits	Leaves and buds eaten in salad or used to make tea Fruits eaten raw or dried
134	Rosaceae	*Rubus* sp.	Young leaves and fruits	Leaves used as a substitute for tea Fruits eaten raw
135	Rosaceae	*Sanguisorba minor* Scop.	Leaves	Eaten with salad or cooked with meals
136	Rosaceae	*Sarcopoterium spinosum* (L.) Spach.	Young shoots	Eaten raw or cooked with meals

No.	Family	Scientific name	Part used	Mode of consumption
137	Rubiaceae	*Galium aparine* L.	Young shoots, fruits	Shoots cooked with meals Seeds used as a substitute for coffee
138	Solanaceae	*Solanum nigrum* L.	Mature fruits	Eaten raw
139	Solanaceae	*Physalis angulata* L.	Fruits	Eaten raw
140	Tetragoniaceae	*Tetragonia tetragonoides* Kuntz.	Leaves	Cooked like spinach
141	Typhaceae	*Typha latifolia* L.	Whole plant	Young shoots eaten raw or friedYoung spikes boiled or friedDried spikes ground to make bread and cakesMature seeds roasted Fresh rhizome eaten raw, fried, or cooked as a substitute for potatoDried rhizome ground to make bread Pollen used as a substitute of flour
142	Urticaceae	*Urtica dioica* L.	Young leaves	Cooked with meals as a vegetable
143	Urticaceae	*Urtica pilulifera* L.	Young leaves	Cooked with meals as a vegetable
144	Urticaceae	*Urtica urens* L.	Young leaves	Cooked with meals as a vegetable
145	Zygophyllaceae	*Nitraria retusa* (Forssk.) Sscher.	Fruits	Eaten raw

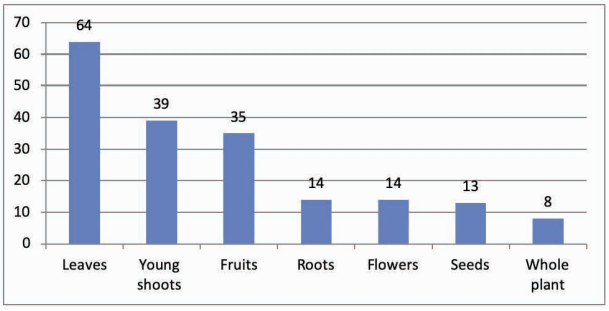

Figure 1. *Number and percentage of the parts used.*

Table 3. *Mode of consumption*

Mode of consumption	No. of species	%
Raw	90	35.7
Cooked	56	22.2
Salad	41	16.2
Spice	13	5.1
Roasted	9	2.3
Boiled	8	3.2
Tea	8	3.2
Bread and cakes	8	3.2
Fried	7	2.8
Coffee	5	2.0
Juice	4	1.6
Sweets	3	1.2

be eaten raw directly, or in salad, or can be cooked with vegetable meals (Tables 1 and 3; Figure 2).

3. DISCUSSION

Although rural people have been consuming wild plants for a long time, it is not yet known that many wild plants are consumed as edible plants, and our cultural heritage and traditional use of these plants are not recorded by ethnobotanical studies; therefore, this study is the first attempt to document edible wild plants in Libya.

The study revealed that approximately all household members were involved in the collection and consumption of edible wild plant species. This helps to ensure the maintenance of indigenous knowledge associated with edible wild plant species. Many research studies were conducted which revealed that the edible wild plants are rich in carbohydrates,

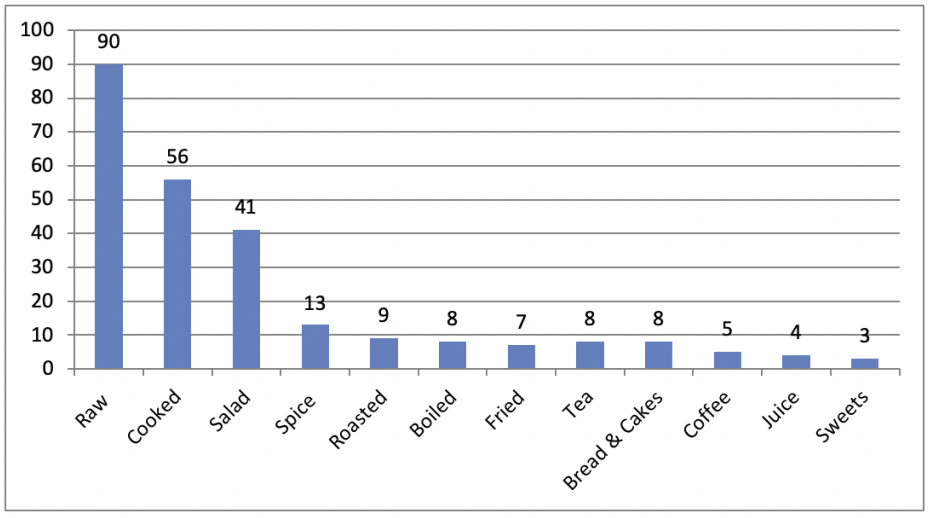

Figure 2. *Mode of consumption*

proteins, vitamins, and mineral salts that can maintain good health and prevent various diseases (Berihun and Molla, 2017). However, in general, there is a decline in the consumption of edible wild plant species that were used during periods of drought and famine. The local knowledge about the nutritional composition and side effects of the edible wild plant species is very scanty, and little is known about the undesirable side effects such as toxicity originating from the edible wild plants (Polat et al., 2015). Apart from their food value, most of the identified edible wild plant species are used for other different purposes. The local people harvest edible wild plants not only for food, but also for medicinal purposes, construction, firewood, and furniture. Thus, this has led to a high level of threats to the edible wild plant species.

The informants rated agricultural land expansion, mainly due to increasing demand for arable land due to increasing human population, as the principal threat to edible wild plant species diversity; other important factors are overgrazing, uncontrolled fire setting, and overharvesting and overexploitation of edible wild plants. The introduction of new grazing land due to high livestock density has possibly resulted in overgrazing of large areas. Similarly, the informants claimed fuel wood collection to be equally hazardous as overgrazing in threatening edible wild plant species. An uncontrolled fire setting was also another major threat to wild plant species. It was observed that many woody species were severely affected by such fires where the tree and shrub stands decline and some are completely burnt and made to disappear.

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