

*Original research***Edible wild herbaceous plants consumed in Giresun province**N. Şule ÜSTÜN¹, Aysun PEKŞEN^{2,*}, Sanem BULAM³, Harbiye DURAN²¹Ondokuz Mayıs University, Faculty of Engineering, Department of Food Engineering, Samsun, Turkey²Ondokuz Mayıs University, Faculty of Agriculture, Department of Horticulture, Samsun, Turkey³Giresun University, Faculty of Engineering, Department of Food Engineering, Giresun, Turkey

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Abstract: Giresun province of the Eastern Black Sea Region has a rich biodiversity in terms of vegetation. The edible wild herbaceous plants collected by people living in rural areas are sold in the local markets of Giresun. In this study, the herbaceous plants sold in the local markets of Central, Bulancak and Şebinkarahisar districts of Giresun province having different climate and geographical characteristics were determined and identified during 2015-2016. As a result of interviews with vendors and consumers of edible wild herbaceous plants local names, edible parts and consumption patterns of these plants were noted. In our surveys, it was determined that 28 edible wild plant species belonging to 13 families were sold as vegetables in local markets of Central, Bulancak and Şebinkarahisar. Polygonaceae family was the most common family with 6 taxa. In three of the local markets, *Portulaca oleraceae*, *Smilax excelsa*, *Trachystemon orientalis* and *Urtica dioica* were predominant species. *Ornithogalum umbellatum* was the most widely sold species in the Central and Bulancak district local markets whereas *Polygonum cognatum* was the most widely sold species in Şebinkarahisar district market. It was determined that the edible wild herbaceous plants sold in the local markets have a great diversity and its richness has reflected in Giresun cuisine. The consumption of these plants is of great importance in terms of human nutrition as well as economic perspective of the local people.

Keywords: Edible wild herbaceous plants, local markets, consumed parts, consumption patterns

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Introduction

There is an important historical background of plant collection for nutrition. Nowadays, in order to meet the needs of the people especially in the rural areas, many wild herbaceous plants are collected by local people from the mountains and around the forests for their own use, and even sold in the local markets. In Turkey, consumption of natural spontaneously grown herbaceous wild plants as a vegetable is quite common. These herbaceous plants are the sources of both nutrition and income of the people in rural areas. However, many of these plants are not still scientifically diagnosed, they are known by their local names. The same herbaceous plants may be called by

different names or different herbaceous plants may be called by the same names varying according to the regions. Consumption of these herbaceous plants is traditionally widespread among elderly people, and there is a danger of future loss. Ethnobotanical studies have focused on the documentation of traditional uses of herbaceous plants by indigenous cultures (Özgen et al., 2004; Kendir and Güvenç, 2010). In recent years, it has been seen that studies on this subject are increasing all over the world including Turkey (Bharati and Kumar, 2014; Korkmaz et al., 2016; Mükemre et al., 2016). Nowadays, the demand for the consumption of the edible wild herbaceous plants has been increased, since it is of

great importance to use these plants for nutrition due to being a cheap and rich source of mineral substances, vitamins, antioxidants and fiber (Yıldırım et al., 2001; Şekeroğlu et al., 2006; Özen, 2010). These herbaceous plants also add flavor and color to the food. In addition to their use as food, they are also evaluated for dye, ornamental and medical purposes (Siyamoğlu, 1984; Çakılıcıoğlu et al., 2011).

The use of edible wild herbaceous plants in Turkey has a rich history, especially in the Aegean and Black Sea Regions there is a common herbaceous plant culture (Faydaoğlu and Sürücüoğlu, 2011). The Black Sea Region is extremely rich in terms of vegetation due to different climatic conditions and many of the edible wild herbaceous plants existed in the vegetation are consumed in various forms by the local people (Doğan et al., 2004; Yılmaz and Deveci, 2004; Özbucak et al., 2006; Türkan et al., 2006; Özbucak et al., 2007; Polat et al., 2015; Kibar and Temel, 2016; Demir, 2017). The gathering of natural herbaceous plants, the sale in the local markets and the use in local dishes in the province of Giresun has been very common since ancient times. Along with that, it is very important to compile the local names and the uses of edible wild herbaceous plants consumed and sold in the markets and to transfer this information to next generations.

The aim of present study was to reveal species diversity and usage patterns of the herbaceous plants sold in the local markets of the Central, Bulancak and Şebinkarahisar districts of Giresun province having different climate and geographical characteristics.

Materials and Methods

Giresun province is situated between 40° 53' and 40° 57' N and 38° 19' and 38° 28' E in Black Sea Region of the North-eastern Turkey. The Giresun Mountains, which run parallel to the shore, have resulted in the formation of two different climatic zones on the provincial soils that have very different characteristics in terms of land structure. Due to different climate and topographical features, this study was carried out in Central and Bulancak districts located in coastal and Şebinkarahisar located in high altitude area of Giresun province. Central and Bulancak districts have a warm and rainy climate, but Şebinkarahisar province has completely different from the coastal area, a transition climate is observed between the semi-arid Central Anatolian climate and the humid Black Sea climate. There

are differences between the two parts of the province in the distribution of the natural plant cover as it is in the varied climate conditions. The average altitude in Şebinkarahisar province is around 1000-1500 m. Hazelnut farming is common in the region. In addition to this, livestock and vegetable growing are also observed for livelihood (Anonymous, 2017).

In the study, surveys were conducted in the local markets of the mentioned districts of Giresun province of Turkey during 2015 and 2016 years. Edible wild herbaceous plant samples were collected from the local markets, numbered and photographed. With interviews made with the local people, the local name of the plant, the parts of the plant used, how it is consumed and preserved, have been compiled. Identification of species were made on the basis of the collected plant samples (Davis, 1985-1988).

Results and Discussion

Scientific and local names and consumed parts of the edible wild herbaceous plants sold in the Central, Bulancak and Şebinkarahisar local markets of Giresun are given in Table 1.

Photographs of some edible wild herbaceous plants which were the most widely sold species in the local markets are given in Figure 1.

In this study, total 28 taxa belonging to 13 families were determined. According to obtained data, it is determined that the most common consumed family in the region is Polygonaceae family with 6 taxa (21.43%), following Asteraceae with 4 taxa (14.29%), Chenopodiaceae with 4 taxa (14.29%) and Apiaceae with 3 taxa (10.71%) (Table 2).

Beta vulgaris var. *cicla* (Yabani pazı, Pezük, Pezik), *Capsella bursa-pastoris* (Medik, Kuş otu, Kuşkuş otu, Kuş ekmeği), *Portulaca oleraceae* (Yabani semizotu, Pürpürüm, Pirpirim), *Similax excelsa* (Dikenucu, Merulcan, Mervecen, Meralcan, Merolcan), *Trachystemon orientalis* (Galdirik, Kaldirik) and *Urtica dioica* (Isırgan, Sırgan) are the most sold species in the Central, Bulancak and Şebinkarahisar local markets. *Ornithogalum umbellatum* (Sakarca, Çöplüce, Çökülce) is the most widely sold edible wild herbaceous plant in Central and Bulancak districts, while *Polygonum cognatum* (Madımak) is the most widely sold one in Şebinkarahisar. Therefore, these are the major herbaceous plants in the local cuisine culture of Giresun.

Table 1. The Latin and local names and consumed parts of the edible wild herbaceous plants sold in the local markets of Giresun

Family	Latin name	Local name	Local market	Consumed parts
Amaranthaceae	<i>Amaranthus retroflexus</i>	Horoz ibiği, Hoşkuran, Hoşkuran	Central, Bulancak	Shoot, leaf
Apiaceae	<i>Aegopodium podagraria</i>	Mendek	Central, Bulancak	Leaf
Apiaceae	<i>Pimpinella</i> sp.	Ezeltene, Ezeltere, Ezeltele, Cecik	Central, Bulancak	Shoot
Apiaceae	<i>Anethum graveolens</i>	Dereotu	Central, Bulancak, Şebinkarahisar	Aboveground
Asteraceae	<i>Bellis perennis</i>	Papatya	Şebinkarahisar	Leaf
Asteraceae	<i>Taraxacum officinale</i>	Haldar	Şebinkarahisar	Leaf
Asteraceae	<i>Tragopogon pratensis</i>	Teke sakalı	Şebinkarahisar	Aboveground
Asteraceae	<i>Tussilago farfara</i>	Kabalak, Gabalak	Central, Bulancak	Leaf and stem
Boraginaceae	<i>Trachystemon orientalis</i>	Galdirik, Kaldirik	Central, Bulancak, Şebinkarahisar	Stem and petioles
Brassicaceae	<i>Capsella bursa-pastoris</i>	Medik, Kuş Otu, Kuşkuş otu, Kuş Ekmeği	Central, Bulancak, Şebinkarahisar	Aboveground
Chenopodiaceae	<i>Atriplex patula</i>	Kızılca, Kızıl otu	Şebinkarahisar	Aboveground
Chenopodiaceae	<i>Beta vulgaris</i> var. <i>cicla</i>	Yabani pazı, Pezük, Pezik	Central, Bulancak, Şebinkarahisar	Leaf, stem
Chenopodiaceae	<i>Chenopodium album</i>	Sirgen, Has hoşkuran, Hoşguran, Hoşuran	Central, Bulancak, Şebinkarahisar	Aboveground
Chenopodiaceae	<i>Chenopodium foliosum</i>	Kazayağı	Central, Şebinkarahisar	Aboveground
Liliaceae	<i>Asphodelus aestivus</i>	Kiriş, Çiriş	Şebinkarahisar	Aboveground
Liliaceae	<i>Ornithogalum umbellatum</i>	Sakarca, Çöplüce, Çökülce	Central, Bulancak	Corm, green parts
Malvaceae	<i>Malva neglecta</i>	Ebegümeçi, Ebegümeçi	Central, Şebinkarahisar	Fresh shoots, leaf
Malvaceae	<i>Malva sylvestris</i>	Büyük ebegümeçi, Kazan karası	Şebinkarahisar	Fresh shoot, leaf
Papaveraceae	<i>Chelidonium majus</i>	Gelin parmağı	Şebinkarahisar	Leaf
Polygonaceae	<i>Polygonum bistorta</i>	Güçükdene, Küçüktene	Central, Bulancak	Leaf
Polygonaceae	<i>Polygonum cognatum</i>	Madımak	Şebinkarahisar	Fresh shoot with leaf
Polygonaceae	<i>Rheum ribes</i>	Yemlik, Işgın	Şebinkarahisar	Shoot
Polygonaceae	<i>Rumex acetosella</i>	Kuzu kulağı, Ekşimek	Central, Bulancak, Şebinkarahisar	Leaf
Polygonaceae	<i>Rumex crispus</i>	Evelek, Efelik, Evelik	Şebinkarahisar	Leaf
Polygonaceae	<i>Rumex patientia</i>	Labada, Efelik, Kuzu kulağı	Şebinkarahisar	Leaf
Portulacaceae	<i>Portulaca oleraceae</i>	Yabani semizotu, Pürpürüm, Pirpirim	Central, Bulancak, Şebinkarahisar	Aboveground
Smilacaceae	<i>Similax excelsa</i>	Dikenucu, Merulcan, Merveçen, Meralcan, Merolcan, Dikence Dikencili, Kırçan	Central, Bulancak, Şebinkarahisar	Leaf and petioles
Urticaceae	<i>Urtica dioica</i>	Sirgan, Isırgan	Central, Bulancak, Şebinkarahisar	Aboveground



Figure 1. Photos of some edible wild herbaceous plants sold in Giresun public markets. a) *Similax excelsa*, b) *Polygonum bistorta*, c) *Trachystemon orientalis*, d) *Pimpinella* sp., e) *Portulaca oleraceae*, f) *Urtica dioica*, g) Edible wild herbaceous plant sellers, h) *Ornithogalum umbellatum*, i) *Amaranthus retroflexus*, j) *Beta vulgaris* var. *cicla*, k) *Aegopodium podagraria*

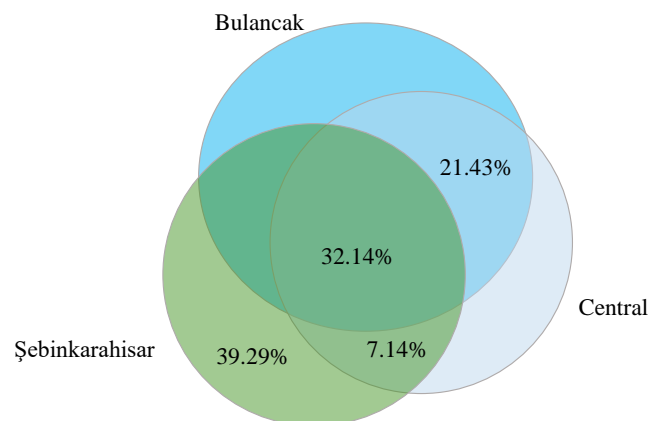
Table 2. Families, number of taxa and their share within the total edible herbaceous plants sold in the local markets of Giresun

Family name	Taxa number	Rate (%)
Amaranthaceae	1	3.57
Apiaceae	3	10.71
Asteraceae	4	14.29
Boraginaceae	1	3.57
Brassicaceae	1	3.57
Chenopodiaceae	4	14.29
Liliaceae	2	7.15
Malvaceae	2	7.15
Papaveraceae	1	3.57
Polygonaceae	6	21.43
Portulacaceae	1	3.57
Smilacaceae	1	3.57
Urticaceae	1	3.57
Total	28	100.00

Edible wild herbaceous plants are used extensively as a vegetable in different cities of Turkey (Koca et al., 2015; Demir, 2017). These edible wild herbaceous plants are known by the same or different local names and consumed in different forms in different regions (Tan and Taşkın, 2009; Abak, 2010; Polat et al., 2015; Kayabaşı et al., 2016; Demir, 2017).

Although *Ornithogalum umbellatum* is reported as a toxic species in the literature (Elias and Dykeman, 2009), its leaves and bulbs are nutrient source for the local people as they like and consume them as a vegetable. Due to the specific cooking method, it has not been experienced any toxicity problems. If this plant is consumed too much, it may show toxic effects. For this reason, caution should be exercised in its consumption.

Among the studied districts, Şebinkarahisar was the richest for total species with the 22 species. The number of species determined just in Şebinkarahisar was 11 (39.29%), while 9 species sold in the Central, Bulancak and Şebinkarahisar markets overlapped (32.14%) (Figure 2). These results show that there are significant changes in the natural plant species and hence their consumption in the districts with different climatic and geographical structures within the same provincial borders.


Figure 2. Distribution of herbaceous plants species according to districts

Giresun nature is covered with rich vegetation. This environment directly influences the culinary culture. In addition to the edible wild herbaceous plants that are generally consumed in the local cuisine, wild mushrooms also have an important place in terms of nutrition and income. In the local markets of Giresun, lots of edible wild mushrooms including *Agaricus campestris*, *Boletus aestivalis*, *B. edulis*, *Cantharellus cibarius*, *Hydnum repandum*, *Lactarius* spp., *Laetiporus sulphureus*, *Lepista saeva*, *Macrolepiota procera*, *Marasmius oreades*, *Morchella* spp., *Pleurotus eryngii*, *P. ostreatus*, *Ramaria* spp., *Sarcodon imbricatus* and *Sparassis crispa* are sold and they are consumed by the public (Pekşen et al., 2016). In addition, *Vaccinium myrtillus* leaves known as "çalı çileği or çileklik", which we do not include in the list, since it is a bush-formed plant, are also widely sold in the local markets (Figure 3). It is known that soup made from young shoot leaves is called "çalı çileği (çalı yaprağı) çorbası". In recent years, *Vaccinium myrtillus* and *V. arctostaphylos* species have economic importance in Black Sea Region local markets (Çelik, 2012). Moreover, it was determined in the study that some natural plants such as thyme, linden, mint, camellia, moon daisy, rosehip and blueberry are also dried, sold and used in herbal tea preparation in Giresun.



Figure 3. *Vaccinium myrtillus* (Çalı çileği) leaves in the local market

The people of the region collect the herbaceous plants from the surrounding forests and open spaces. Edible wild herbaceous plants are mostly collected and sold by older women between March and July months. These plants have an important place in Giresun cuisine. Although some edible wild herbaceous plants such as *Beta vulgaris* var. *cicla* and *Portulaca oleraceae* commonly collected from nature for consumption, their culture forms are also grown in home gardens. It has also been found that fresh leaves of the herbaceous plants are mostly used, but fresh shoot and above ground parts of different herbaceous plants are also utilized. These local plants are consumed as soup, stuffing (rice or meat filled and cooked plant leaves), dible (rice cooked with various vegetables), roasting, frying, mihlama (a dish made with vegetables and eggs), vegetable patty, pastry, hotcake and pickle. Herbaceous plants consumed as vegetables are freshly consumed as raw or cooked, and also preserved as canned, pickled, dried or frozen.

Conclusion and Recommendations

In the study, the edible wild herbaceous plant species sold in the local markets of the selected Central, Bulancak and Şebinkarahisar districts differ due to the different topographic and climatic characteristics. A large number of edible wild herbaceous plants are used for human nutrition in Giresun province. These plants make a significant contribution to the nutrition of the local people with their nutritional and medicinal value. In addition, identification and taking inventory of edible wild

herbaceous plant species used as vegetables are also very important in terms of transfer of plant diversity to the future, protection and preservation of them. Recording and ensuring sustainability of this natural heritage inherited from generations to generations is so important. For this reason, this study is important in terms of providing basic information and giving some ideas to new ethnobotanical studies to be carried out in Turkey. The research will also shed light on the cultivation of these herbaceous plants and the determination of their nutritional values.

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