ETHNOBOTANICAL AND ECOLOGICAL STUDIES OF WILD EDIBLE PLANTS FROM BUGEAC STEPPE, REPUBLIC OF MOLDOVA

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Abstract: *A study on the traditional use of wild edible plants in three settlements (Bugeac, Dezghingea and Topal, district Comrat), from the Bugeac steppe region, located in the southern part of the Republic of Moldova was carried out. Total 38 wild edible species from 33 genera and 17 families were identified. Data were obtained through ethnobotanical interviews with villagers in the investigated area. A total number of 17 people of different age were interviewed. The plants are presented in a table with Latin and common names, useful parts, ethno-medical uses and methods of consumption. Nine species are frequently collected and used by locals*

Keywords: *ethnobotany, bio-ecology, wild edible plants, Bugeac steppe;*

1. Introduction

Data collection on traditional medicine, more recently, ethnobotanical studies are increasing in recent decades in many countries [1, 3, 7-12, 14-16, 18]. Gaining knowledge about native edible and medicinal plants used in folk medicine and for human consumption through ethnobotanical studies requires reconsideration of their pharmacological action and nutritive value for the better use. Also, the information directly contributes to the conservation and sustainable use of their resources.

In our republic ethnobotanical studies show a relatively new research direction [5], but perspective as local flora provides us a large number of plants with important edible and therapeutic qualities, some growing wild in abundance, requiring no cultivation investment. Little information and documented references [2] on the ethnobotany of edible and medicinal plants spontaneously growing in the flora of Republic of Moldova are available withal.

This study was aimed to identify and document the wild edible plants and their traditional uses by three local communities in the Bugeac steppe region, located in the southern part of the Republic of Moldova.

2. Methods

Study area

Using both ethnobotanical and ecological methods, the study was carried out in three rural settlements from district Comrat: vill. Bugeac (N 46° 24' 23", E 28° 42' 48"), vill. Dezghingea (N 46° 25' 13", E 28° 37' 24") and vill. Topal (N 46° 27' 35", E 28° 40' 23").

These localities are situated in the northern part of Bugeac steppe region, characterized generally as steppes of the plains, plateau and hills of the western Black Sea, west of the Dniester with the main habitat type being Ponto-Sarmatic steppes.

Data collection

Ethnobotanical information was accumulated via informed questionnaires and interviews with local people during the 2012-2014 periods. A total number of 17 people of different age were interviewed. Additionally, to enrich understanding about different species of edible plants growing spontaneously in the studied area oral informal discussions with key informants was carried out. Traditional knowledge related to the collection and methods of use of wild edible species was documented.

Identification of the plant samples

Collected plant samples were pressed according to standard guides. At the next stage, samples were stick to the herbarium cardboards and taxonomically identified using the up to date scientific works [4, 6, 13, 19]. Labelled voucher specimens are deposited in the Herbarium of the Botanical Garden (Institute) of Academy of Sciences of Moldova.

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3. Results and discussions

Use A total of 38 species from 33 genera and 17 families that have been traditionally consumed in the study area were documented. They account 5,3% of the 715 species registered in the Bugeac steppe region, located in the southern part of the Republic of Moldova [17] .

Recorded data are presented by list of species with scientific and local name, family, plant parts used and method of consumption (Table 1).

Table 1. *Wild edible plants traditionally used as food in the study area*

Nr	Botanical name/ local name	Family	Part used	Methods of consumption
1	*Allium sphaerocephalon* L. / ceapă	*Alliaceae*	leaves, bulbs	raw, salad, boiled, soup
2	*Amaranthus retroflexus* L./ ştir	*Amaranthaceae*	leaves, seeds	raw, boiled, soup, maize meal
3	*Asparagus officinalis* L./ sparanghel	*Asparagaceae*	young shoots	raw, cooked, soup, sauces
4	*Cichorium inthybus* L. / cicoare	*Asteraceae*	leaves, root	raw, cooked, soup, sauces
5	*Arctium lappa* L. / brusture	*Asteraceae*	young leaves, root	raw, cooked for diabetics
6	*Scorzonera hispanica* L./ lăptiucă	*Asteraceae*	leaves, roots	raw in salad, cooked, soup
7	*Taraxacum officinalis* Wigg./ păpădie	*Asteraceae*	leaves, root, flower	steamed, preserved in vinegar
8	*Artemisia absinthium* L. / pelin	*Asteraceae*	young leaves	wormwood wine, condiment
9	*Bunias orientalis* L. / brăbin	*Brassicaceae*	leaves, young stem	cooked as vegetable
10	*Capsella bursa-pastoris* (L.) Medik / traista ciobanului	*Brassicaceae*	leaves, seedpods, seeds	raw, salads, condiment, seeds ground and used in soup
11	*Lepidium latifolium* L. / scvamăriț ă	*Brassicaceae*	leaves, seeds, roots	raw, salad, sauce, condiment
12	*Atriplex hortensis* L. / lobodă	*Chenopodiaceae*	leaves, seeds	raw, soup, bread baking
13	*Atriplex patula* L. / lobodă	*Chenopodiaceae*	leaves, seeds	cornmeal, sausages, roast lamb
14	*Chenopodium album* L. / tămâiț ă	*Chenopodiaceae*	leaves	raw or steamed, been dishes
15	*Chenopodium foliosum* Aschers / lobodă	*Chenopodiaceae*	leaves, seeds	cooked, rice dishes, read baking
16	*Glycyrrhiza glabra* L. / iarbă dulce	*Fabaceae*	roots	flavouring sweets, baked goods
17	*Berberis vulgaris* L. / dracilă	*Berberidaceae*	fruits	raw, cooked, jelly, jam, juice
18	*Lathyrus tuberosus* L. / limba cucului	*Fabaceae*	roots	baked like sweet potato
19	*Medicago sativa* L. / lucernă	*Fabaceae*	leaves, seeds	tea, salad, soup
20	*Trifolium pratense* L. / trifoi	*Fabaceae*	young leaves	raw, salad, boiled as vegetable
21	*Origanum vulgare* L. /sovârv	*Lamiaceae*	leaves, flowers	condiment, salad dressing, tea
22	*Thymus marschallianus* Willd./ cimbru	*Lamiaceae*	leaves, flowers	condiment, tea, salad
23	*Linum perenne* L. / ineaț ă	*Linaceae*	seeds	cooked as a flavouring, oil
24	*Lavatera thuringiaca* L. /nalbă	*Malvaceae*	young leaves	raw or cooked
25	*Malva neglecta* Wallr. / colăcei	*Malvaceae*	young shoots	raw, salad, cooked like lettuce
26	*Malva pusilla* Smith / colăcei mărunți	*Malvaceae*	young fruits	raw
27	*Malva sylvestris* L. / colăcei	*Malvaceae*	leaves	salad, soup
28	*Oenothera biennis* L. / luminița nopții	*Onagraceae*	fleshy roots, seeds	boiled, steamed, oil
29	*Phragmites australis* (Cav.) Trin.ex Steud. / trestie	*Poaceae*	young shoots, seeds	ground for making dumplings, ground and used as a flour
30	*Rumex acetosella* L. / măcriș	*Polygonaceae*	leaves	raw, green salad, cooked, soup
31	*Crataegus monogyna* Jacq. / păducel	*Rosaceae*	fruits, leaves	raw, jam, tea, dried for later use
32	*Fragaria viridis* (Duch.) Weston / fragi	*Rosaceae*	fruits	raw or cooked
33	*Geum urbanum* L. / cerențel	*Rosaceae*	leaves	cooked, soup, condiment
34	*Cerasus fruticosa* Pall. / cireș	*Rosaceae*	fruits	raw, dried for later use, tea
35	*Prunus spinosa* L. / porumbar	*Rosaceae*	fruits	raw, jellies, syrup, liqueur
36	*Rosa canina* L. / măceș	*Rosaceae*	fruits	raw, jam, syrup, tea
37	*Galium verum* L. / sânziene	*Rubiaceae*	flowering stems	food colouring
38	*Urtica dioica* L. / urzică	*Urticaceae*	leaves	nettle soup, purée

The most utilized species belong to *Rosaceae* (6 sp.), *Asteraceae* (5 sp.), *Fabaceae*, *Chenopodiaceae* and *Malvaceae* with 4 species each, that represent more than 60% of registered species. Three species are members of *Brassicaceae* family and the

remaining families (*Alliaceae, Amarathaceae, Asparagaceae, Berberidaceae, Lamiaceae, Linaceae, Onagraceae, Poaceae, Polygonaceae, Rubiaceae* and *Urticaceae*) are represented by one or two species each. Herbs and shrubs make up the highest proportion of the registered edible species.

At the present time, less than 30% of recorded species are used by local people, while another more than 70% have been frequently consumed in the past, but not anymore. A good numbers of species (*Phragmites australis, Amaranthus retroflexus, Bunias orientalis, Trifolium pratense, Lathyrus tuberosus, Malva neglecta, Atriplex hortensis, Lepidium latifolium* etc.) were mentioned by respondents as plants consumed during famine (in XX century, after the 2nd World War) and no longer used today. Less of the traditional knowledge has been lost in the case of wild edible fruits.

Young shoots, leaves and fruits are the plant parts used commonly by local people in the area. One of the most representative edible plant in this region is the nettle (*Urtica dioica*), which is used widely even nowadays. It is a very popular vegetable being an indispensable component in a variety of recipes. The most frequent is "*tocana de urzici*" (fig 1.), made from qiuck-boiled young leaves mixed with stewed onions and flour. Another common use of the plant in the area is nettle soup.

Fig. 1. *"Tocana de urzici" prepared with young leaves of Urtica dioica*

The species used for fruits (*Rosa canina, Prunus spinosa, Berberis vulgaris, Crataegus monogyna, Fragaria viridis*) continue to be collected and traditionally used. Most of them belong to the *Rosaceae* family. The most commonly collected wild fruit species remain to be *P. spinosa,* followed by *R. canina.* The fruits of *P. spinosa,* called *"porumbrele"* are consumed directly in the field after the first frosts, when they became overripe. A home-made alcoholic drink with *P. spinosa* fruits is an up-to-date tradition in the area. It is also used as medicinal remedy in the treatment of diarrhoea. The fruits of *R. canina* and *C. monogyna* are harvested, dried and used mainly for their therapeutic properties as a tea.

Other important species used as wild vegetables are *Rumex acetosella, Origanum vulgare, Malva pusilla, Taraxacum officinale*. The most common method of consumption are fresh, added to salads, or cooked by boiling and steaming of young leaves or young shoots as part of various recipes for soups, sauces, dumplings etc. A delicious young shoots and leaves of *R. acetosella* are eaten raw in the spring. They are also an excellent addition to salads and soups,

called in the area "*supă verde*". The immature fruits of *Malva pusilla* are collected and immediately consumed by children. The most commonly used herbs such *R. acetosella* and *O. vulgare* are taken out from their natural habitat and transferred in home gardens to be cultivated for home consumption or even for commercial purposes.

Fig. 2. *Wild fruit species used in the area (P. spinosa, R. canina, B. vulgaris, C. monogyna*

The aromatic plants O*riganum vulgare* and *Thymus marschallianus* are used as culinary and food flavouring plants due to the presence of essential oil. These species are largely prepared as herbal teas and used in the treatment of various affections related to respiratory and digestive systems. Many other species (*Cichorium inthybus, Arctium lappa, Taraxacum officinalis, Artemisia absinthium, Crataegus monogyna, Glycyrrhiza glabra, Oenothera biennis, Prunus spinosa, Rosa canina, Urtica dioica, Capsela bursa-pastoris, Berberis vulgaris, Geum urbanum, Urtica dioica*) have been mentioned to possess curative effects, being traditionally used for treating many diseases.

Some species represent the indispensable part of ritual food or drink for religious holidays. An example of this is the traditional drink "*vin cu pelin*" obtained by maceration of wormwood young leaves in home-made red wine. It is consumed in spring at religious holidays "*Rusalii"* and "*St. Marina*" as a symbol of health and blood purification.

Fig. 3. *Species used for food flavouring and as vegetables (Th. marschallianus, T. officinalis, O. vulgare)*

The ecological studies reveal that according to ecomorphs, the most numerous group is hemichriptophytes with 18 species that represent 47,3% of registered taxa. The absolute predominance of the hemichriptophytes indicates a climate with a hydric deficit in the area. Therophytes are represented by 11 species (28,9%), followed by phanerophytes with 5 species (13,2%), geophytes and chamephytes with 2 species (5,3%) each (fig. 4).

From a phytogeografic point of view (geoelements), it is noticed that most of the species belong to the Mediterranean geoelement (36,8%), followed by Eurasiatic (31,6%), circumpolar (13,2%), adventive and European with a share of 7,9% each. Less in number (2,6%) are cosmopolite species (fig. 5). The distribution of the species according to humidity show a large presence of xeromesophytes, comprising 20 species (52,7%), followed by mesophytes represented by 16 species (42,1%), mesohygrophytes and xerophytes with 1 species (2,6%) each (fig. 6).

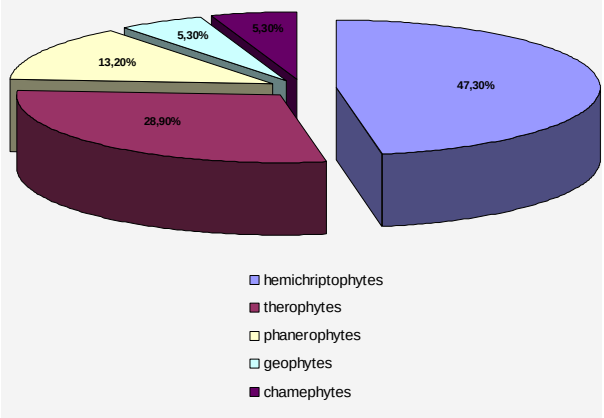

Fig. 4. *Ecomorphs of wild edible plants*

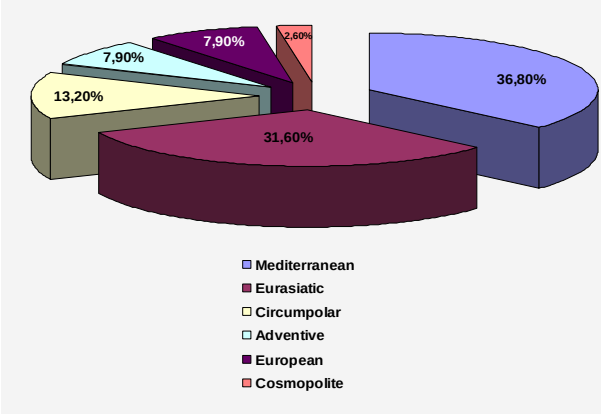

Fig. 5. *Distribution of geoelements*

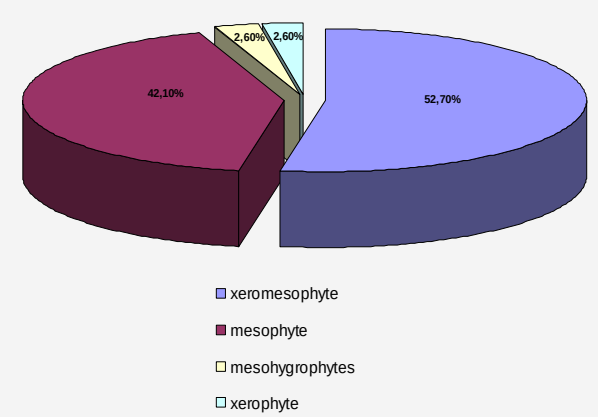

Fig.6. *Spectrum of bioforms*

Conclusions

Taxonomic diversity of the flora of the studied area is reach and provides diverse valuable plants. Most of the mentioned species are popular among the communities of studied area being potentially a good source of edible and medicinal plants.

The result of the study reveals that people from investigated area possess a good knowledge on the wild edible plants growing around their villages. At the present time, less than 30% of recorded species are used by local people, while another more than 70% have been frequently consumed in the past, but not anymore. A good numbers of species were mentioned by respondents as plants consumed during famine and no longer used today.

That demonstrate that they continue to use the knowledge of wild medicinal crop in their day-to-day life, but the tradition of their using is obviously declining. That fact encourages further ethnobotanical investigations in rural areas not only in this region but also throughout the country.

Assuredly, the harmonious connection of this traditional knowledge with modern science is basic in order to promote conservation and sustainable use of these indigenous edible plants.

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