

Maramures and Muntii Apuseni – Crop Plant Diversity and Living Past in Romania

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Summary – Funded by Seed Savers Exchange, plant genetic resources have been studied in selected mountainous areas of Northern and Central Romania by staff members of the Statiunea de Cercetari Agricole Suceava and the Institut für Pflanzengenetik und Kulturpflanzenforschung Gatersleben in September 1994. Traditional agriculture has been found unbroken in some never collectivized villages of the Maramures region and the Muntii Apuseni mountains. Landraces and local varieties are still common there, and 309 accessions, mainly of cereals, vegetables, pulses, spices, medicinal and fibre plants, were collected. Even relict crops, such as landraces of Einkorn wheat, buckwheat, hemp and flax, could be reported from recent cultivation. The efforts to maintain the indigenous material still being cultivated in Romania by *ex situ* and *in situ* conservation should be continued.

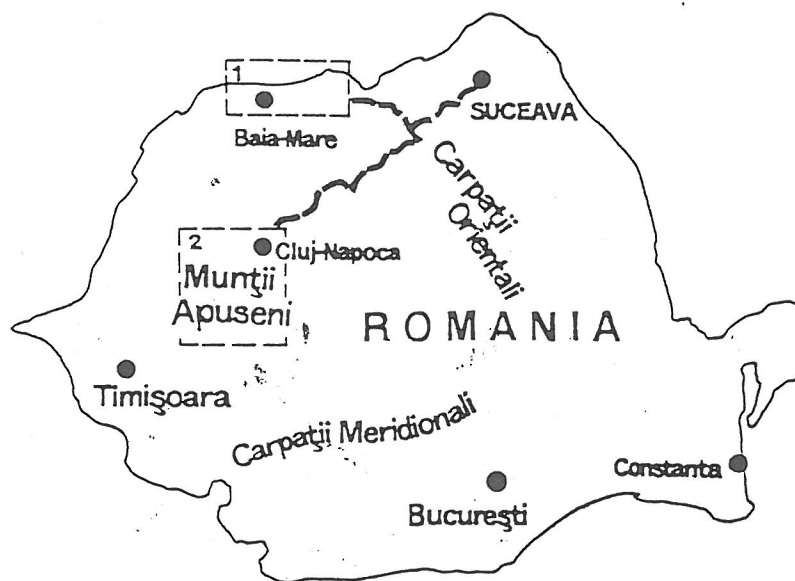
Introduction

First, joint explorations of plant genetic resources had been undertaken in Romania by staff members of the Statiunea de Cercetari Agricole, Banca de gene Suceava and the Institut für Pflanzengenetik und Kulturpflanzenforschung (IPK), supported by SSE in 1993. These activities were concentrated in the surroundings of Suceava, Bukovina region [see previous article by Helga Rosso and Marcel Avramiuc].

The recent mission, financed by SSE and organized with the logistic help of Nancy Arrowsmith from the Arche Noah organization in Austria, went to promising regions of Eastern Carpathians, Maramures and Muntii Apuseni between 14th and 24th of September 1994 (see Table 1).

Participants were the Romanian colleagues Marcel Avramiuc (Maramures exploration), Valer Chereches (Muntii Apuseni tours) from the Suceava genebank, Nikolai Friesen, Alexander-von-Humboldt, fellow at IPK from the Central Siberian Botanic Garden Novosibirsk, and Klaus Pistrick. Gabriela Lakatos, Odorheiu-Secuiesc, contributed essentially to the success of the mission as an interpreter, by her engaging communication with the friendly and hospitable Romanian farmers.

The expedition was planned as a multispecies mission considering the standard Gatersleben collecting approach (Hammer et al., in print). The mission should give an actual survey of the plant genetic resources still under cultivation in the Maramures and Muntii Apuseni, which regions are regarded as last refuges of traditional agriculture in Romania. Indigenous material of cultivated plants had to be collected for *ex situ* conservation.

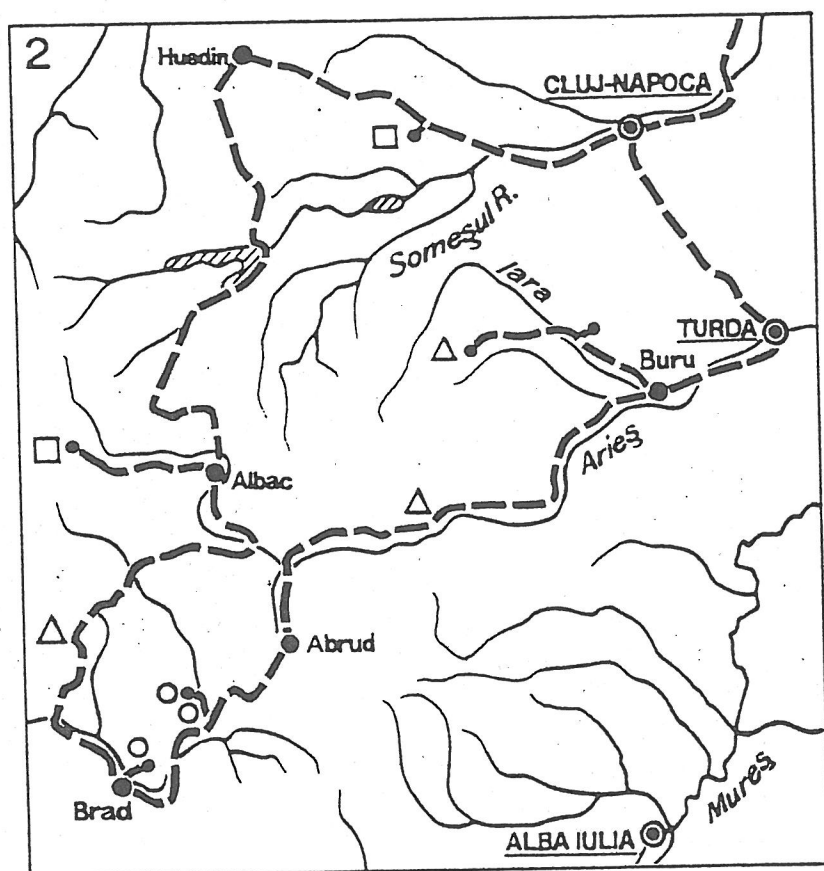


Results

Genetic erosion had been reported to be highly increased for parts of the Romanian territory fifteen years ago already (Szabó 1981). The remains of local varieties of cultivated plants disappeared rapidly in the last decade, even in remote places of eastern Europe. That is why positive results of this mission in some mountainous areas of Northern and Central Romania have been rather unexpected.

The loss of plant genetic resources in the lowlands with its large fields must be mentioned, because during the socialist period agricultural production cooperatives and state-owned agricultural enterprises were established in every village.] Genetic erosion includes field crops as well as vegetables and pulses, because socialist farms also distributed seeds for individual gardening. After the 1989 revolution, agricultural land came back into private hands. Even former landless people in the villages have 50 ares per person. During the travel, harvesting farmers have been seen everywhere working hard by hand in the wide plains of formerly state-owned enterprises. Suitable agricultural engines and cheap fuel are not available for most of them now. The harvest of maize and potatoes is transported by horse-drawn wagons on the roads. But the temporary return to traditional methods does not automatically bring back landraces. On the large fields, modern varieties are grown.

There are 10 percent of the agricultural area in difficult conditions, however, which have never been collectivized in Romania. This is particularly true in isolated mountainous villages with small fields, often situated on steep slopes and poor soils. Because in higher altitudes former grain fields had been converted mainly into grassland, collecting activities concentrated on the foothills and valleys, where most of the visited villages are located between 400 and 800 m. A landscape-dominating traditional agriculture and rural structure is maintained especially in the Iza valley of the Maramures depression. This isolated region took a separate cultural development in the past.



Route of the collecting missions to Maramures (1) and Muntii Apuseni (2) in September 1994. Collecting sites of some relict crops and local varieties are indicated as follows:

- | | |
|--------------------------------|---------------------------------|
| ○ - <i>Triticum monococcum</i> | ◇ - <i>Fagopyrum esculentum</i> |
| △ - <i>Cannabis sativa</i> | □ - <i>Linum usitatissimum</i> |



Maramures villages are living museums of ethnography and agrarian history. Seeds of old traditional crops are stored in 100-year-old wooden farm houses, and old cereal landraces are still being threshed at Bogdan Voda. (All photos by Klaus Pistrick)



The Muntii Apuseni mountains are highly isolated as well in some parts, because of difficult orographic conditions and long-lasting lack of infrastructure. The cultivation of cereal landraces (oats, rye, common wheat, barley) has decreased distinctly there. But the recent difficult economic situation prevents farmers now from buying seeds of modern varieties instead of using their old landraces. Even the reintroduction of growing cereals or fibre crops is stimulated for domestic use on marginal lands by the poor living conditions. So new oat fields were found at Poiana Horea (1000 m) at the upper border of possible cereal cultivation, where grain cultivation had been abandoned 20 years ago. One farmer at Arieseni (850 m) had flax only as a weed from former cultivation in his rye field and used the seeds as medicine for cattle. He was now collecting seeds from these remnants of a local variety to reintroduce *Linum usitatissimum* as a fibre crop.

Landraces and local varieties in general are highly valued in many families for their quality and special uses as a part of traditional life. Old maize varieties, for example, remain in culture to prepare the most tasteful mamaliga, Einkorn wheat is estimated locally as the best fodder crop, or rye is grown particularly for distillery in higher altitudes; hemp and flax provide home-woven clothes. In this connection, the aims of our mission and genebanks in general were rapidly understandable for the people in the villages. Only at some tourist places young people regarded plant genetic resources more as a commercial good than as the heritage of mankind.



Genetic erosion is already very advanced in Romania. Many of the former grain fields at higher altitudes have been converted into grassland; as in southern Muntii Apuseni.



In every village, friendly Romanian people understood the importance of the mission and supported its work by providing plant material, information and demonstration. Cloth is home-woven from landraces of *Cannabis sativa* and *Linum sativum* that are cultivated in the house gardens of Agirbiciu in northern Muntii Apuseni.

However, genetic erosion is increasing rapidly. Modern Romanian or foreign varieties of cereals, potato, vegetables and pulses reach remote settlements faster than asphalt roads. While hard driving up by a terrible way to a remote mountainous village in the region of the Iza valley, Maramures, its Romanian name Glod (= mud) became easily understandable. But even there a new Belgian variety of the garden bean already had replaced local material. Also, most of the young people do not like to continue the traditional hard farmer's life in the rough countryside.



Triticum monococcum, cultivated since the beginning of agriculture (5000 B.C.) in the Balkan peninsula, remains as a relict crop in villages north of Brad, Muntii Apuseni.



Farmers in the villages north of Brad, Muntii Apuseni often continue to use their own grain seeds and old equipment for economic reasons.

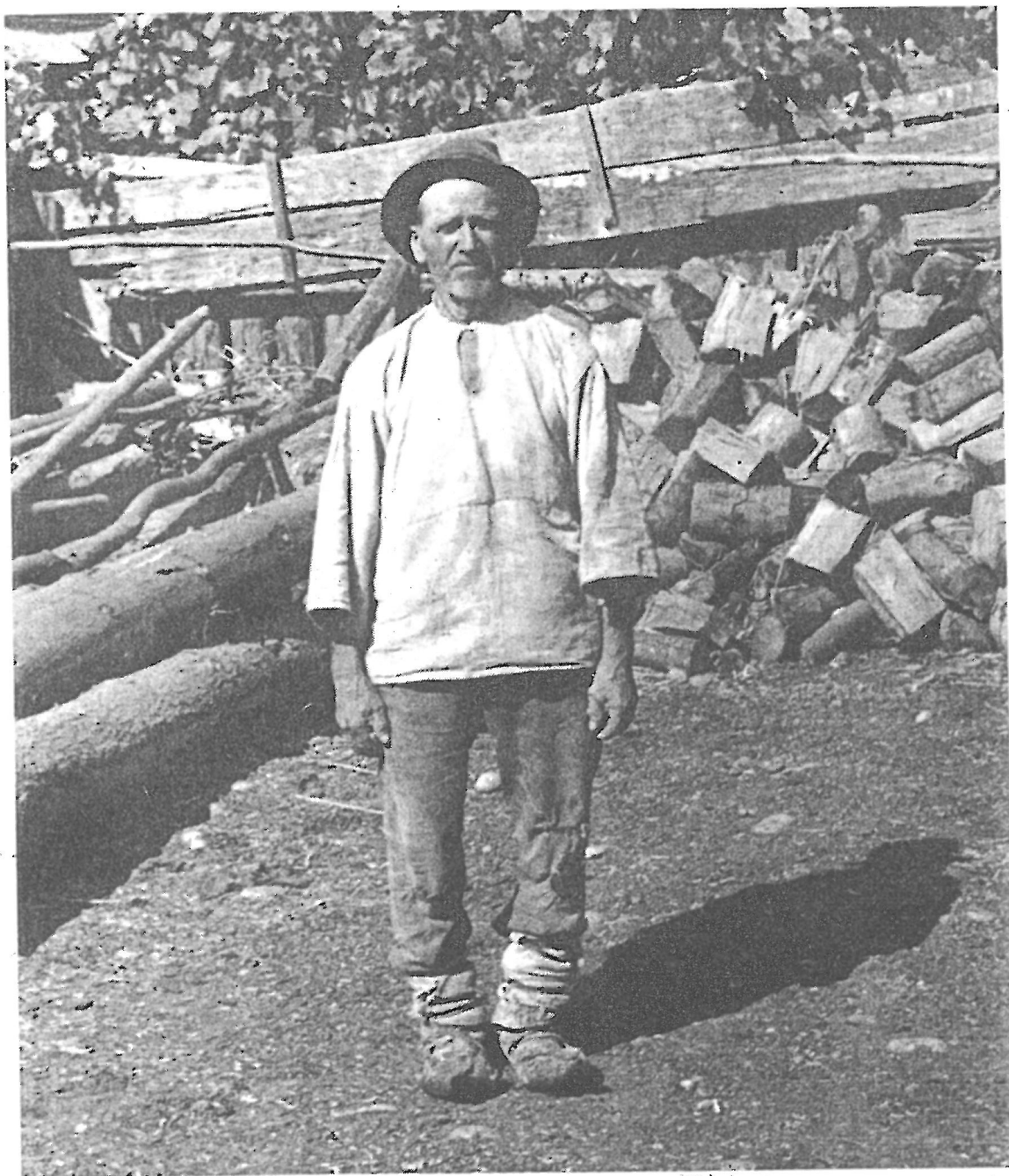
Nevertheless, during this short 1994 mission a wealth of 309 accessions was still obtained (Table 2). The results have been summarized for publication in Plant Genetic Resources Newsletter, edited by the Food and Agricultural Organization of the United Nations and the International Plant Genetic Resources Institute (Pistrick et al., in print). Some short remarks on the material collected should be given here as well.



In small house-gardens of mountainous villages in the Eastern Carpathians, many local vegetable and spice varieties are still found. Collected at Mestecanis (1000 m):

Atriplex hortensis f. *rubra*, *Beta vulgaris*, *Lactuca sativa*, *Brassica oleracea*, *Allium cepa*, *A. cepa aggregatum* group, *A. schoenoprasum*, *A. sativum*, *Anethum graveolens*, *Petroselinum crispum*, *Satureja hortensis*, *Artemisia dracunculus*.





Hemp, *Cannabis sativa*, used up to the present for home-woven work clothes (above), is seen bleaching against a wall beside one of the famous Maramures gates (left).

Because of the late collecting time, most of the cereal accessions could be collected in the villages, where the shocks had been brought for thrashing after drying in the fields on the surrounding slopes. Old-fashioned threshing machines were seen in action, as decades before in Central Europe. Besides landraces of *Triticum aestivum* cultivated for home-made bread, even its diploid ancestor *Triticum monococcum* can be reported here

from recent cultivation. Einkorn wheat ('alak') became a relict crop in Romania in the 50s already, but was found in 1992, surprisingly, at Valea Bradului northeast of Brad by Valer Chereches from the Suceava genebank. He had obtained some spikes of the ancient cereal when routinely asking for local varieties in a village with rather modern houses and large gardens near the new buildings of the town. These were strange conditions, certainly, because *Triticum monococcum* is known presently only from a few very remote places of the Mediterranean area (Southern Italy, Albania, e.g.). During this mission, the crop was found cultivated in light, stony calcareous soils in the villages of Ploi, Salatruc and Valea Bradului at altitudes of 300-450 m. Einkorn seems to be strongly restricted to the Brad valley as a relict site of cultivation. It is highly esteemed there as a valuable fodder grain even more productive than common wheat in marginal lands. The ears with the hulled grains are bruised completely and used together with maize and common wheat as fodder for pigs, cattle and hens.

But the main cereals grown for animal feeding in higher altitudes are oats, rye and barley, of which could be collected also some landraces. Buckwheat ('hrisca') was always limited to the northernmost parts of Romania. Its cultivation had already sharply decreased at the beginning of the century, but could be found again at Bogdan Voda and Ieud during the mission.

Below about 700 m, maize is the predominating food and fodder crop on larger fields, as it is in the house-gardens of the collecting area. As mush (mamaliga) it plays an important role in the diet of local inhabitants. Romania, with its suitable climatic conditions, became between the wars the world's third-ranking nation in the production and the second in the export of maize. New North American varieties had been introduced in the eighties of the last century already; in 1904 drought-resistant dent corn came from Argentina, and since the sixties most of the remaining indigenous races have been replaced by hybrid varieties (Cristea 1975). Maize genetic resources could be collected and maintained in a large amount (about 2,000 accessions) at the Suceava genebank, fortunately. Some samples of yellow- and red-grained flint and semident corn have been added from this mission.

In the fields and gardens - bordered often by hemp rows - maize, garden beans and squash are intercropped, sometimes with beets and cabbage. These mixed cultures of 'Indian types' are valued for their high and diversified total yield. Local pumpkins (*Cucurbita pepo*) with round to oval greenish-grey mottled to dark green or partly yellow coloured fruits are widely grown for fodder purposes. The roasted seeds are sometimes eaten. The traditionally widely used oil is now extracted only in some villages of Muntii Apuseni (Surduc, Bulzestii de Sus) from seeds with a normally developed testa, the oil content of which does not differ generally from that of the Styrian oil pumpkin seeds with reduced coats.

The diversity of the garden bean (bush and pole types) seems to be comparable to those of other centers of secondary variability, like the Western Carpathians or Caucasus mountains. But seed coloration is mostly different. Romanian farmers prefer to sow a mixture of different morphological types which can be recognized from seed shapes and

coloration patterns. Sometimes more than a dozen seed types per village have been found. The enormous variability has been strongly reduced in many places by collectivization and intensive propagandizing of uniform modern varieties by the state-owned enterprises. Besides garden and runner bean, only local varieties of faba bean and pea are cultivated, and those very rarely. Other pulses, such as lentil and chickpea, could not be found anymore.



Romanian couple from Surduc, Muntii Apuseni, displaying predominant local squash variety, fruits used as fodder for pigs and seeds for oil preparation.

Potatoes, in Romania more an important vegetable than a basic food, are represented in the territory by local varieties with reddish and brown tubers. Strange types, such as one with dark violet long tubers and dark violet flesh collected from the surroundings of Piatra-Neamt by colleagues of the Suceava genebank, have not been encountered.

The red plants of *Atriplex hortensis* var. *ruba*, can be found everywhere in the villages. Its local name is 'loboda.' Apart from the seeds of some common vegetables, such as cabbage, carrots or tomatoes, which are often bought at the market, local material of *Beta vulgaris*, *Brassica oleracea*, *Brassica napus*, *Daucus carota* and *Lactuca sativa* could be obtained. An especially interesting tomato variety with very small, red, round fruits, ca. 1.5 cm in diameter, has been found intercropped with maize and pumpkins at Salatruc, Muntii Apuseni.

The recent cultivation and traditional domestic processing of local fiber crops (*Linum usitatissimum*, *Cannabis sativa*) at the small farms of Maramures especially, seems to be unique at present. Romania has up till now the largest area of hemp-cultivation in Europe excluding the former Soviet Union. Hemp genetic resources could be important together with the know-how for large-scale cultivation and manufacturing in connection with the comeback of *Cannabis sativa* as a universal industrial crop.

Spices and medicinal plants represent an important part of the spectrum of cultivated plants in Romanian house gardens, including different-shaped bronze, white and dark red onions, shallots and one- or more-rowed garlic grown together with savory, poppy and parsley. *Artemisia dracunculus*, *Levisticum officinale* and *Coriandrum sativum* are additional, rarely used spices. *Armoracia rusticana* has been found cultivated only for its leaves but not for the roots in the Maramures. This type of usage occurs in the Caucasus mountains as well. Besides uncommon medicinal tea plants such as *Malva crispa*, *Chrysanthemum parthenium* and *Inula helenium*, *Geranium macrorrhizum* from Matisesti, Muntii Apuseni, *Chrysanthemum balsamita* and *Artemisia abrotanum* as odoriferous plants should be mentioned here. The latter traditional old magic and medicinal plant ('lemnus') has been found in several old farmers' gardens of Muntii Apuseni and Maramures.

Genetic resources in fruits cannot be included here. Nevertheless, there should be interesting material of local mountainous varieties of plums, cultivated everywhere in the region in a large amount, especially for the traditional Romanian 'palinca' brandy.

The exciting wealth of plant genetic resources still being cultivated in some remote areas of the Eastern Carpathians, Maramures and Muntii Apuseni, should be the aim of further detailed investigations. An inventory of landraces and local varieties and further collecting activities are necessary to safeguard interesting material by ex situ conservation.

Because of its unique diversity in cultivated plants, traditional agricultural practices, anthropogenic landscape and old rural architecture, the Iza valley seems to be suitable to establish a national park of international importance. This could be likewise a solid basis for a successful implementing of in situ conservation of plant genetic resources in this area.



A member of the Ukrainian-speaking minority of northern Maramures, Tisa Valley, displays an outstanding type of dark red onion.

Selected References

- Cristea, M., 1975: Germoplasma la porumb. Editura Ceres, Bucuresti, 299 pp.
- Hammer, K., R. Fritsch, P. Hanelt, H. Knüpffer and K. Pistrick, in print: Collecting by the Institute of Plant Genetics and Crop Plant Research at Gatersleben (713 - 725). In: L. Guarino et al., Collecting Plant Genetic Diversity.
- Pistrick, K., M. Avramiuc, V. Chereches and N. Friesen, in print: Collecting plant genetic resources in Romania (Eastern Carpathians, Maramures, Muntii Apuseni). Plant Gen. Res. Newsl.
- Szabó, A. T., 1981: Problems of genetic erosion in Transylvania, Romania. Kulturpflanze 29:47 - 62.

Table 1. Chronology of the Expedition to North and Central Romania to Collect Plant Genetic Resources (September 9-30, 1994)

- 9th Flight from Leipzig to Vienna, discussion and preparation for the trip with colleagues from Arche Noah at Schloß Schiltern.
- 10-12 Travel by car via Vienna, Győr, Budapest, Szolnok, Oradea, Cluj-Napoca, Tirgu Mures, Odorheiu-Secuiesc and Piatra-Neamt to Suceava.
- 13 Suceava. Meeting with the Romanian colleagues of the Banca de gene and preparation for the mission to the Maramures district (Sept. 14-17).
- 14 Drive to Salistea de Sus via Gura Humorului, Voronet, Moldovita, Cimpulung Moldovenesc, Iacobeni, Borsa, Moisei and Sacel. Collecting at Demacusa, Mestecanis and Moisei.
- 15 Travel to Ocna Sugatag via Bogdan Voda, Birsana and Calinesti. Collecting in the area of the Iza valley (Bogdan Voda, Ieud, Rozavlea, Strimtura, Valeni).
- 16 Continuing the work in the area of Iza valley (Calinesti, Slatioara, Glod and Budesti). Drive to Livada via Cavnice, Baia Mare, Seini.
- 17 Discussions at the Experimental Station of Agriculture at Livada. Return to Suceava via Negresti Oas, Sighetu Marmatiei, Poienile de sub Munte, Viseu de Sus, Moisei and Borsa. Collecting in the Tisa valley northwest of Sighetu Marmatiei (Remeti, Sapinta) as well as in the Ruscova valley north of Viseu de Sus (Repedea, Poienile de sub Munte).
- 18-19 Suceava. Registering and preparing of the material collected on the days before. Preparation of the mission to the Muntii Apuseni mountains (Sept. 20-24).
- 20 Drive to Turda via Iacobeni, Vatra Dornei, Bistrita, Dej, Cluj-Napoca. Collecting northeast of Bistrita (Poiana Stampei, Piatra Fintinele and Rusu Birgaului).