

14th EDGG Field Workshop: Ukrainian steppes along climatic gradients

Ukraine, 25 May – 3 June 2020

Second Call

Background

The history of EDGG Field Workshops began in 2009 in Romania (Dengler et al. 2009). Before 2014 these events were called “EDGG Research Expeditions”. Up to now, 13 Field Workshops have been organized: Romania (2009), Ukraine (2010), Bulgaria (2011), Italy (Sicily) (2012), Greece (2012), Russia (2013), Spain (2014), Poland (2015), Serbia (2016), Italy (Central Apennines) (2017), Austria (2018), Switzerland (2019) and Armenia (2019).

The aim of Field Workshops is to sample different taxa groups in grasslands (mainly vascular plants, mosses and lichens) across multiple scales (from 0.0001 to 100 m²) using a standardized methodology (Dengler et al. 2016). Some animal taxa have also been sampled in several expeditions together with vegetation data, for example spiders (Polchaninova et al. 2018), leafhoppers (Filibeck et al. 2018), and butterflies (Magnes et al. 2018). The results obtained from the analyses of high-quality data from several expeditions have been already published: Romania (Dengler et al. 2012; Turtureanu et al. 2014), Bulgaria (Pedashenko et al. 2013), Ukraine (Kuzemko et al. 2014, 2016) and Russia (Polyakova et al. 2016).

These expeditions served as the basis for the creation of the “GrassPlot” Database which focuses on precisely delimited plots of eight standard grain sizes (0.0001; 0.001; ... 1,000 m²) and on nested-plot series with at least four different grain sizes (Dengler et al. 2018). In total, the database now comprises a total of 190,673 plots, with 4,654 nested-plot series including at least four grain sizes (Biurrun et al. 2019).

Applications

All EDGG members are welcome to apply to participate in EDGG Field Workshop via the website www.edgg.org/ after **7th January 2020**. Deadline for applications is **15th February 2020**. Confirmation of participation and feedback on travel grant applications will be given not later than 1 March 2020.

All applicants except those who already participated in four or more Field Workshops have to **submit a motivation letter** (200 words maximum), explaining why they are interested in participation and what they would contribute its success during and after the Field Workshop. High priority

will be given to applicants who are willing to carry out the soil analyses afterwards. Experts of non-plant taxa, such as grasshoppers, leafhoppers, spiders, butterflies, fungi or soil metagenomics are also welcome to join if they are able and willing to carry out their sampling in a way that allows joint analyses with the vegetation diversity data. Such applicants are requested to discuss a potential sampling design prior to application with Iwona Dembiczy and Idoia Biurrun and to clarify with the local organizer whether there are any legal constraints. The motivation letter is the most important criterion if there are more applications for participation than places or for travel grants than money available.

Travel grants

Travel grants are provided by our parent organization IAVS, and they are only available to members of IAVS in 2020. Priority for travel grants will be given to the following groups of persons: a) students and other applicants from low-income countries; b) well-established and very active participants of previous Field Workshops; c) persons that have already agreed to organize a Field Workshop in the coming years or provide any additional input such as soil analyses or sampling and identification of taxonomic groups other than vascular plants. The final decision will depend on the combination of these three variables. The amount of money provided to a particular grantee is not a fixed sum, but depends on the available money, the demonstrated need of the respective person and his/her relevance to the success of the Field Workshop. Accordingly travel grants can cover parts of the registration fee, the full registration fee or possibly even the travel costs to get to the event.

IAVS and EDGG requires their grantees to be actively involved in the EDGG event and contribute to its success. In case of FW, it is necessary that all participants work intensively during and after the FW to obtain high-quality scientific results. Some of the tasks shared by participants are data entry and digitizing data, sorting and analyzing soil samples, preparing and identification of plant specimens. Post-FW tasks usually require a few days of work for each participant. Participants will be invited as a co-author to one or more publications using these data. It is required that IAVS grantees accept to fulfill tasks relevant to their exper-

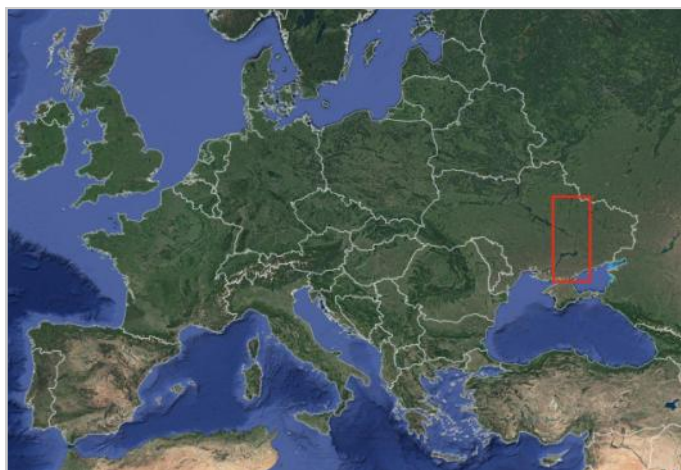


Fig. 1. Location of the study area (red rectangle) in the European context. Map data ©2019 Google, ORION-ME.

tise and capabilities during and after the FW. If a grantee does not fulfill the post-FW task, he or she may be exempted from next year's grants for EDGG events.

Fees

The fees comprise all costs of meals, travel and accommodation starting on 25 May in Kherson and ending on 03 June in Kyiv (Boryspil airport), with the possibility to return to Kherson.

The fees for **full participation** are:

- 650 € for postdocs, senior scientists or other regularly employed persons who are not IAVS members
- 600 € for postdocs, senior scientists or other regularly employed persons who are IAVS members
- 600 € for students (including PhD students) and unemployed persons who are not IAVS members
- 550 € for students (including PhD students) and unemployed persons who are IAVS members

After decision on the final list of participants and on travel grants, each participant will receive an invoice with the amount of money to be paid. **Payment** has to be made in cash on the first day of participation.

For **cancellations**, we charge the following fees:

- Until 10 April: 50% of your regular fees
- After 10 April: 80% of your regular fees

Topic and aims of the Field Workshop

The 14th EDGG Field Workshop will be held in Ukraine for the second time. The first was ten years ago, in 2010, in Central Podolia, Vinnytsia region (Dengler et al. 2010). During that expedition, 21 nested-plot series (0.0001 to 100 m²) and 184 normal plots (10 m²) were sampled, covering the full variety of dry grasslands, mainly meadow steppes and rocky grasslands (Kuzemko et al. 2014).

The new expedition will take place in Southern and Central Ukraine (Fig. 1). We will work in Kherson, Zaporizhzhia, Dni-

pro, Kharkiv and Poltava administrative regions. The main aim will be to investigate plant richness patterns of steppe grasslands along climatic gradients (precipitation and temperature) from the driest semi-desert communities in the south to the meadow steppes in the north.

The study area

The research area is flat and lies within the East European Plain (Fig. 1). The southern part belongs to the Black Sea Lowland, the northern part - to the Dniro Lowland (Poltava plain). The central part of the study area is divided by the Dniro River into two parts, one lies on the left bank of the river (Dniro Lowland), the other steep right bank belongs to the Dniro Upland.

The Dniro glacier, which covered almost the entire surface of the northern part of the expedition route in the forest-steppe zone, was extremely important for the formation of the modern relief. Therefore, the plateau is cut not only by contemporary river valleys, but also by numerous ancient valleys and gullies because of the glacier melting. All the research area is covered by loess and loess-like deposits 20-25 m depth, sometimes exposed. These sediments form the Ukrainian loess belt, which is one of the biggest loess formations in the world (Muhs 2007). In the central part within the Dniro Upland, the surface of the Precambrian foundation lies above sea level and forms granitic outcrops.

The climate is continental. It corresponds to three types according to Köppen climate classification (Beck et al. 2018): BSk – Arid, steppe, cold; Dfa – Cold, no dry season, hot summer; Dfb – Cold, no dry season, warm summer. On the southernmost area mean annual temperature is 10.3°C and mean annual precipitation is 399 mm. While in the northernmost part of the research area they are 8.9°C and 591 mm respectively (Fig. 2). On Fig. 3 we represent Walter and Lieth climatic diagrams built using “climatol” R package (Guijarro 2019) and Worldclim Version 2.0 (Fick & Hijmans 2017) for some of the localities for the expedition.

Soil types above the loess vary depending on climate and vegetation type. The main soils are chernozems with different humus content and different soil depths. Other soil types also occur - kastanozems, podzols, alfisols and others. Sometimes chernozem is influenced by salinity and replaced by solonetz and solonchak varieties. According to the physiographic zonation of Ukraine (Popov et al. 1968), the soils are dark and typical kastanozems (chestnut soils) of 40-50 cm depth and 2.5-4% humus content on the southernmost part of the expedition route. Moving to the north they are replaced by southern saline chernozems (45-50 cm depth, 4% humus content), afterwards by southern low-humus chernozems (60-70 cm, 5%), common low-humus chernozems (60-65 cm, 5.5-6%), and common chernozems (70-100 cm, 6.8-7.2%), and finally by deep chernozems (115-130 cm, 6-8%) in the northernmost steppe part. Podzols and alfisols are also present under the forests in the forest-steppe zone.

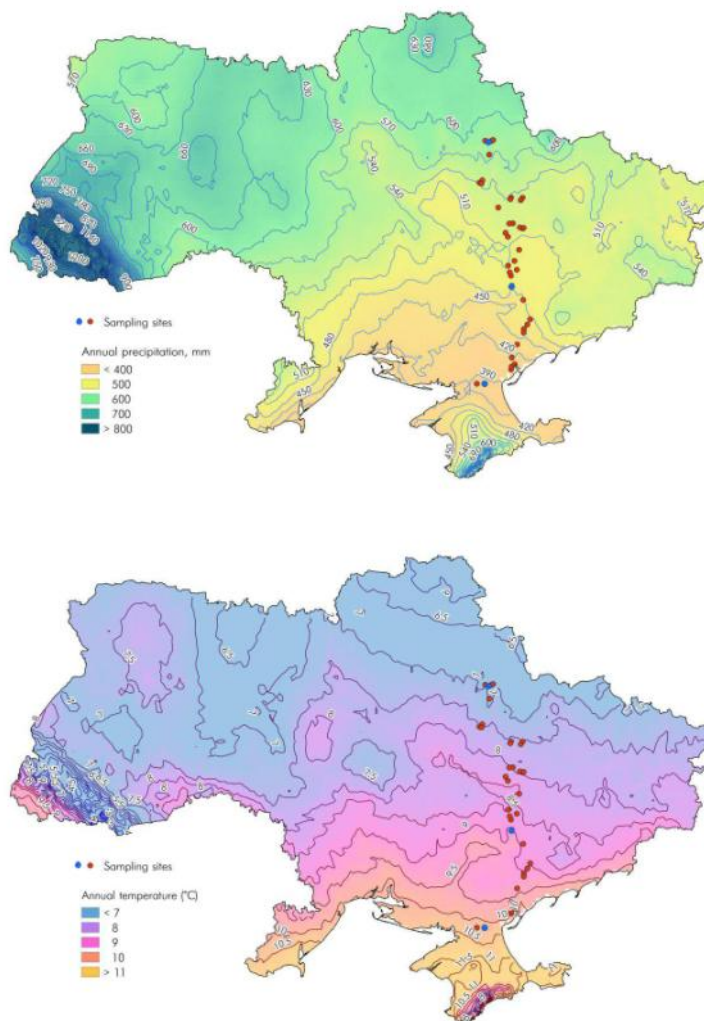


Fig. 2. Maps of Ukraine with approximate sampling locations with contour lines of annual precipitation (on the top) and mean annual temperature (at the bottom). Blue dots represent localities shown on Fig. 3.

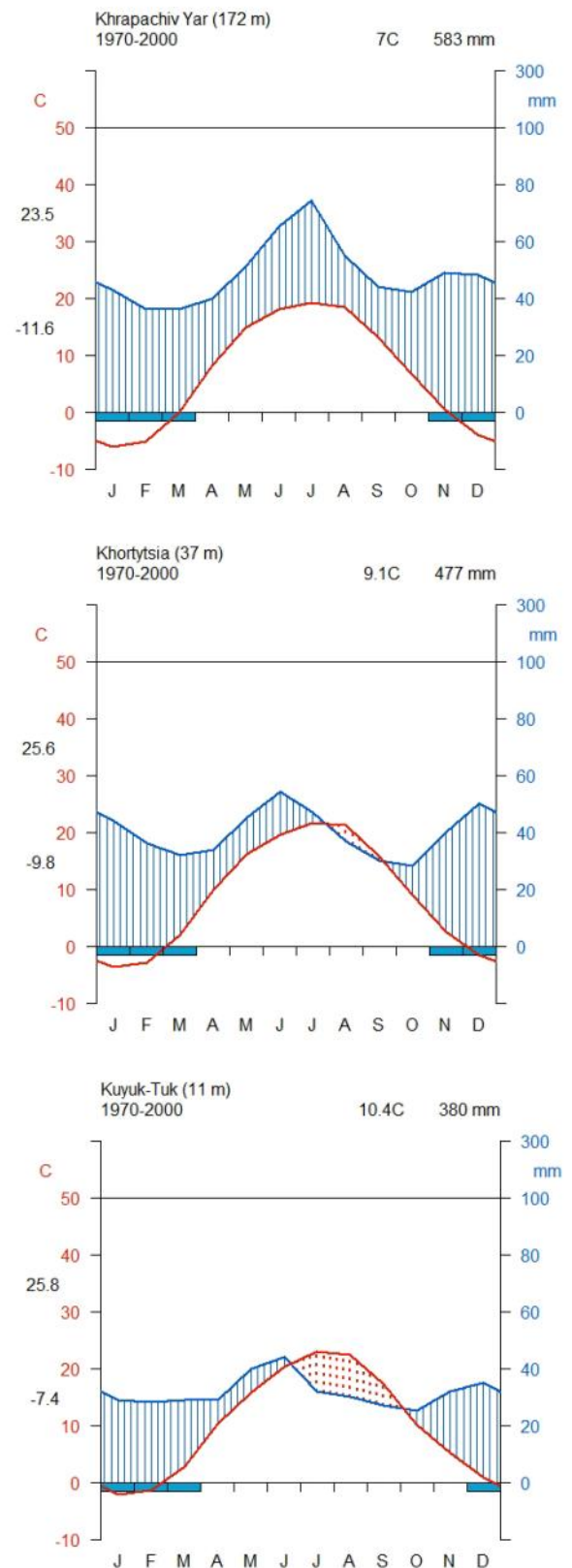


Fig. 3. Walter and Lieth climate diagrams on some localities of the expedition. A: Khrapachiv Yar village, ending point (N 50.260, E 34.499); B: Khortytsia Island, mid-workshop point (N 47.810, E 35.099); C: Kuyuk-Tuk Island, starting point (N 46.072, E 34.407).

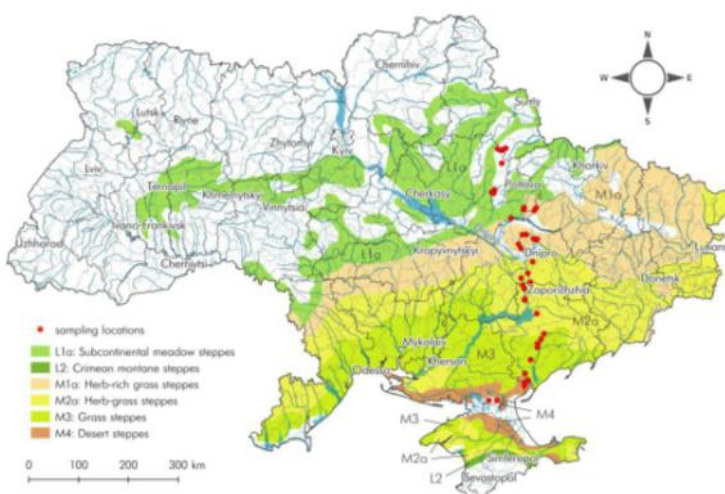


Fig. 4. Map of Ukraine with approximate sampling locations. Vegetation types based on the potential natural vegetation map of Europe (Bohn et al. 2000).

Flora and vegetation

Several physiognomic classification systems arrange steppe types along climatic (latitudinal) gradients and therefore each steppe type corresponds to a zonal vegetation type (Hurka et al. 2019). In Ukraine, the most common way to determine steppe types is based on the dominant approach, which is based on the main dominant species of communities – “edificators”. Higher units traditionally include the following climatic steppe types: desertified steppes, bunchgrass steppes, forb-bunchgrass steppes and meadow steppes (Bilyk et al. 1973). Another similar classification system of zonal steppe types was used in the Map of the Natural Vegetation of Europe (Bohn et al. 2000), according to which the following steppe types are recognized in Ukraine along an increasing precipitation gradient from south to north: desert steppes, grass steppes, herb-grass steppes, herb-rich grass steppes, Crimean montane steppes, subcontinental meadow steppes (Fig. 4).

The classification of vegetation based on complete species lists has not been commonly applied in Ukraine, but it is currently being developed. It still needs clarification and large-scale comparison to distinguish the most suitable units. Desertified salt steppes are classified within the alliance *Artemisia tauricae-Festucion* described from Crimea. Dominants of such communities are *Festuca valesiaca*, *Agropyron cristatum* and *Artemisia taurica* (Kolomiychuk & Vynokurov 2016). We will sample them during the first day in the Sivash Lake region within the Azovo-Syvashskyi National Nature Park (Churiuk and Kuyuk-Tuk Islands) (Figs. 5, 6, 7).

For the bunchgrass steppes, the alliance *Tanaceto millefolii-Galatellion villosae* was proposed (Kolomiychuk & Vynokurov 2016). This unit combines communities with *Agropyron cristatum*, *Astragalus ponticus* (Fig. 8), *Bassia prostrata*, *Ephedra distachya*, *Goniolimon tataricum*, *Stipa ucrainica*,

Tanacetum millefolium and *Vincetoxicum maeoticum* (Fig. 9), which do not occur or only rarely in more humid climates. This type of vegetation will be sampled during the 2nd and 3rd day of the Field Workshop on the slopes of Syvashyk Liman, Utliutsky Liman, Velykyi Utliuk, Tashhenak and Molochna River Valleys, Troitska Balka. These sites preserve many endangered steppe species such as *Allium regelianum*, *A. pervestitum*, *Astragalus reduncus*, *A. pallescens*, *Caragana scythica*, *Cymbobasmas borysthenaica*, *Rhaponticoides taliewii*, *Tulipa gesneriana* (Kostyliov et al. 1994; Kolomiychuk et al. 2012).

More to the north, bunchgrass steppes are replaced by forb-bunchgrass true steppe communities, which are classified within the alliance *Stipo lessingiana-Salvion nutantis*. These communities are characterized by such species as *Astragalus austriacus*, *Bellevalia speciosa* (Fig. 10), *Euphorbia nicaeensis* subsp. *stepposa*, *Galatella villosa*, *Jurinea arachnoidea*, *Nepeta ucranica* subsp. *parviflora*, *Phlomis herba-venti* subsp. *pungens* (Fig. 11), *Teucrium polium*, and *Viola ambigua*. We will sample these communities during the following five days in Zaporizhzhia, Dnipro, Poltava and Kharkiv regions. Natural vegetation can be found in the river valley systems (Dnipro, Samara, Kil'chen: Fig. 12, Oril River Valleys).

In the forest-steppe zone true steppe vegetation is replaced by meadow steppes which can be classified within the alliances *Festucion valesiaca* or *Cirsio-Brachypodium pinnati*. These communities are dominated by grasses (*Elytrigia intermedia*, *Festuca stricta* subsp. *sulcata*, *Stipa capillata*, *S. pennata*, *S. tirsia*,) and forbs (*Filipendula vulgaris*, *Salvia pratensis*, *Trifolium montanum*, etc.). We will sample these vegetation type during the 6th and 9th days of the expedition, in the vicinity of Poltava and Zin'kiv.

Fig. 13 shows the diversity of steppe types we will sample during the Field Workshop.



Fig. 5. Syvash Lake. Photo: D. Vynokurov.



Fig. 6. Kuyuk-Tuk Island. Photo: M. Peregrym.



Fig. 7. Slopes of Churiuk Island and Syvash Lake. Photo: D. Vynokurov.



Fig. 8. *Astragalus ponticus*. Photo: D. Shyriaieva.



Fig. 10. *Bellevallia speciosa*. Photo: I. Moysiienko.



Fig. 9. *Vincetoxicum maeoticum*. Photo: D. Vynokurov.



Fig. 11. *Phlomis herba-venti* subsp. *pungens*. Photo: V. Maniuk.

Preliminary syntaxonomical scheme of *Festuco-Brometea* class vegetation of the research area on the alliance level:

Festuco-Brometea Br.-Bl. et Tx. ex Soó 1947

Tanacetum achilleifolium-Stipetalia lessingianae Lysenko & Mucina in Mucina et al. 2016

Artemisia tauricae-Festucion Korzhenevsky & Klyukin 1991

Tanacetum millefolium-Galatellion villosae Vynokurov in Kolomiychuk & Vynokurov 2016

Festucetalia valesiacae Soó 1947

Stipo lessingianae-Salvion nutantis Vynokurov 2014

Festucion valesiacae Klika 1931

Brachypodietalia pinnati Korneck 1974

Cirsio-Brachypodium pinnati Hadač et Klika in Klika et Hadač 1944d

Preliminary itinerary of the Field Workshop

Our itinerary is shown in Table 1. We will stay in four different accommodations along our travel from Kherson to Kyiv.

Our sampling sites include the Azovo-Syvashskyi National Nature Park, Pryazovskyi National Nature Park, Regional Landscape Park “Dniprovi Porohy” (Fig. 14) and other locally protected areas. Other dry grasslands are parts of designed natural parks or local nature reserves. Some territories are also protected as sites of the Emerald Network in Ukraine.

Important Travel Information

Starting point for the Field Workshop is the main train station in Kherson, where we will collect participants. There are two options for getting to Kherson city: (1) flight to Kyiv and then have a night train from Kyiv to Kherson, or (2) flight to Kherson. There are two international airports in Kyiv - Boryspil International Airport (KPB) and Kyiv International Airport (Zhuliany) (IEV). These are connected with all the main European airports. Kherson International Airport (KHE) is connected with Kyiv, Istanbul, Katowice, Kraków and Vienna.



Fig. 12. Kil'chen River Valley. Photo: V. Maniuk.

We intend to leave from Kherson and start Field Workshop on Monday, 25th May, at 09:00 a.m. FW will finish on Wednesday, 3rd June, at approx. 16:00, in Kyiv city (airport Boryspil) or at approx. 20:00, in Kherson city. At the end of the expedition we can leave participants at the airport as well as in the city center in both cities. Please ensure that you organize your flight journeys so that they fit with this plan. Please book accommodation yourself if you need it on the night before or after the expedition (i.e. 24/25 May in Kherson or/and 03/04 June in Kyiv/Kherson). If you do not have a suitable connection or if you need help with booking hotels, you can contact Dariia Shyriaieva (darshyr@gmail.com) for assistance. For all who plan to reach Kherson by night train from Kyiv, we recommend to contact Dariia for organized purchase of tickets.

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Fig. 13. Examples of dry grasslands in the study regions of the 14th EDGG Field Workshop. From upper left to lower right: forb-bunchgrass steppe in Abazivka (Photo: D. Davydov) and Kil'chen River Valley (Photo: V. Maniuk), bunchgrass steppes on Churiuk Island and in Troitska Balka (Photos: V. Kolomiychuk), meadow steppes in Samara River Valley (Photo: V. Maniuk), desertified salt steppes on Kuyuk-Tuk Island (Photo: D. Vynokurov).

Table 1. Preliminary itinerary of the 14th EDGG Field Workshop in Ukrainian steppes along climatic gradients.

Day	Times (approx.)	Journey	Dry grassland sites (preliminary)	Overnight
25 May (Monday)	09.00 19.00	Kherson - Syvash Lake - Henichesk	Morning: Meeting the group near the main train station (Kherson) Afternoon: Churiuk Island and Kuyuk-Tuk Island	Henichesk
26 May (Tuesday)	08.00 18.00	Henichesk - Syvashyk Liman - Henichesk	Morning: Syvashyk Liman Afternoon: Utiutsky Liman and Velykyi Utiuk River Valley	Henichesk
27 May (Wednesday)	08.00 19.30	Henichesk - Melitopol - Zaporizhzhia	Morning: Tashhenak River Valley, Troitska Balka Afternoon: Molochna River Valley	Khortytsia Island (Zaporizhzhia)
28 May (Thursday)	08.00 18.00	Zaporizhzhia - Stepno-hirsk - Zaporizhzhia	Morning: steppe gulleys in Dnipro River Valley Afternoon: Khortytsia Island	Khortytsia Island (Zaporizhzhia)
29 May (Friday)	08.00 18.30	Zaporizhzhia - Vidradne - Dnipro	Morning: steppe gulleys in Dnipro River Valley Afternoon: regional landscape park "Dniprovi Porohy"	Dnipro
30 May (Saturday)	08.00 18.00	Dnipro - Spaske - Samara river - Dnipro	Morning: Kil'chen River Valley Afternoon: Samara River Valley	Dnipro
31 May (Sunday)	08.00 19.00	Dnipro - Nehvoroshcha - Poltava	Morning: Kil'chen River Valley, Oril River Valley Afternoon: vicinity of Poltava town	Poltava
1 June (Monday)	08.00 18.30	Poltava - Klymivka - Stepove - Poltava	Morning: Orchyk River Valley Afternoon: Berestova River Valley	Poltava
2 June (Tuesday)	08.00 18.30	Poltava - Zin'kiv - Poltava	Morning: vicinity of Zin'kiv town Afternoon: vicinity of Zin'kiv town	Poltava
3 June (Wednesday)	08.00 15.30	Poltava - Kyiv	Morning: returning to Kyiv, stop for the sampling in the flood plain of the Psel River Afternoon: arrival to Kyiv (Boryspil airport)	Departure

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Fig. 14. Dry grasslands in “Dniprovi Porohy” Regional Landscape Park. Photo: V. Maniuk.