Summary

***Conservation of Dry Grasslands in Central-Hungary* LIFE12 NAT/HU/001028, HUGRASSLANDSLIFE project**

A Study on Groundwelling Arthropods IV.

(Spiders (Araneae), Ants (Formicidae))

There are nine different project locations in Duna Ipoly National Park that are important for the conservation of three high priority endangered dry grassland habitats types: Sub-Pannonic steppic grasslands (6240), - Pannonic loess steppic grasslands (6250), - Pannonic sand steppes (6260).

In **2019 (2019.04.18. - 05.22.**) the collecting has been carried out on **19 study sites at 9** locations.

Survey methods

The pitfall trap is a widespread sampling method for the standardized collecting and monitoring of groundwelling arthropods (spiders, bugs, ants). In case of this study we used a modified, double-cup pitfall trap method for sampling. Please see appendix 2. for the exact location of the pitfall traps.

Spiders

In the samples that have been collected in 2019 **1416 spider specimen (567 male, 350 female, 499 juvenile) from 92 species have been identified**. (Values for 2018 are: 3774 spider specimen, 2156 male, 819 female, 799 juvenile from 131 species).

This combined with the results of the earlier collecting (2016-18) sums up in 195 as the total number of identified spider species. (Adding the species we have collected from the vegetation also means 234 species, which is one third of the total Hungarian spider fauna.)

Catch values in 2019 are significantly lower than in 2018. This phenomenon - relapse - was also observed in other arthropod groups. It is assumed that this phenomenon may have been caused by an unusually dry and initially cool spring. We have not experienced anything that has caused habitat degradation. A new faunistic result is the occurrence of ***Ipa terrenus*** (L. Koch, 1879), which was not known from our country, but has already been collected north of the Danube in Slovakia. The occurrence of five protected spider species in several habitats has been confirmed by new data: *Eresus moravicus* Rezác, 2008, *Eresus hermani* Kovács et al., 2015,

Eresus kollari Rossi, 1846, *Nemesis pannonica* Herman, 1879, *Atypus affinis* Eichwald, 1830 (so far only the young specimens have been caught). Each location (project area) is generally in a good environmental state. The fauna of the project locations consists of the characteristic species of the Central European dry grasslands and shrubs. Most species are common in various open and dry habitats. At the same time, there are many rare habitat specialist species that characterize these valuable habitats.

Ants

18 324 specimen (worker) of 33 ant species were collected by 147 pitfall traps in 2019, in 9 geographical places, on 19 study sites, from April 18th to May 19th. This time there were not observations of species not collected earlier. Since 40 ant species were detected from 2014 to 2019 on studied grasslands. This quite high number almost reaches the third of Hungarian checklist. Species richness of examined ant communities is among the highest in Hungary, since one of the diversity highlights of myrmecofauna of Carpathian Basin is found in the mosaic encountering zones of dry grasslands, shrubs and open forests of warmer slopes of hill-lines and low mountains. On some study sites there were 20-22 ant species were collected from a scale area of about 1000 m^2 (during 3-5 years); it is also high value with this intensity of trapping. In 2019 one protected species were detected again: *Formica pratensis* (from Felső-Tápió IV and Domony II.; in great number from the latter, as in last year). Further faunistical data to be mentioned was the occurrence of *Tetramorium hungaricum, Temnothorax interruptus, Lasius distinguendus, Myrmica deplanata* (they are considered comparatively rare among its relatives).

Most important results of the year 2019 in respect of nature conservation:

1) Ant communities with close natural structure (better than semi-natural) can develop in 5 years in secondary grasslands in case of well executed habitat reconstruction and neighborhood with good condition and sufficient propagulum source – as it can be seen for example on Felső-Tápió IV study site. (And in such cases a decade will probably leade to almost natural community.) On this site actual species number reached 11 in 2019, and total species number since 2016 have risen to 14. On the basis of its species composition, this community already belongs undoubtedly to the common and widespread type which dominated by eurytop and agressive Lasius species in dry grasslands. By now its secondary origin can be suspected

only from the relatively great number of disturbance tolerant Tetramorium species and lower diversity and species number than that of the communities in natural state.

2) Removal of shrubs before sampling in 2019 (for example, on the Tétény Plateau) did not disturbed strongly the **ant and the spider communities**, population size of disturbance tolerant species have not increased. These treatments effected at most competitive interactions (as it was planned) and – slightly - favored species preferring xerotherm habitats.

4) The unusually cold and rainy May of 2019 had well recognizable effect on the population size / activity of certain ant species. The change of the number of their collected workers between April and May was quite different in 2018 and 2019, respectively. Their population size / activity increased less, or decreased more from April to May in 2019 than in the former year, when May have not got so unfavourable weather conditions. Negative climate effect was strong tipically on species not depending a lot on the competitive restrictions of other species, e.g. Lasius paralienus which was the most dominant ant in many communities. On subordinate species negative climate effect was not so clear, because the weakening competition of dominant species owing to cold and rainy weather may has – in total - even positive influence on the population dynamics of subordinate ones.

5) The negative effect of early spring weather resulted in a drastic reduction in the number specimens and species of spiders. There was no deterioration in the composition of the communities, so for example, the frequency of species indicating disburbance did not increase. Due to the low number of specimens, the detection of rare species was difficult this year.

6) The rarest, least known and - from this point of view - most interesting type of ant communities living in study sites, namely that dominated by *Camponotus aethiops, Tetramorium, Tapinoma* and *Plagiolepis* species, in addition characterised with fairly smooth species abundance distribution and low abundance of *Lasius* species, still proved to be stable on the time scale of study (more than half-decade). It is also confirms that the ant fauna of stable, natural habitats usually lives in strongely organized communities, which have quite repetitive structure, so they can be typify fairly well.