

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 2018 (2018.04.21.- 05.19.) the collecting has been carried out on **18 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 2018 3774 spider specimen (2156 male, 819 female, 799 juvenile) from 131 species have been identified. This combined with the results of the collecting in 2014 and 2016 sums up in 179 as the total number of identified spider species. Some new faunistic specialties from spiders: *Eresus moravicus* Rezác, 2008, *Chalcoscirtus brevicymbialis* Wunderlich, 1980, *Panamomops inconspicuus* (Miller & Valesova, 1964.), 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.

Ants

In 2018 40.736 specimen (worker) of 29 ant species were collected by 154 pitfall traps in 9 geographical places, on 19 study sites, from April 20th to May 19th. Beyond previous ones there were found 2 new species: *Lasius carniolicus*, which has sporadic occurrence in Hungary (also in its total geographical area), and *Tetramorium hungaricum*. The latter's renewed taxonomical description was published in 2004, the lectotype was collected in the mountains around Budapest, it belongs to *Tetramorium caespitum* species group.

With the new ones, 40 ant species were detected from 2014 to 2018 on the 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 20-21 ant species were collected from a scale area of about 1000 m² (during 3-4 years); it is also high value with this intensity of trapping.

In this year one protected species were detected: *Formica pratensis* (from Felső-Tápió IIa-b, Domony I. and Domony II.; only from the latter one in great number). Further faunistical data to be mentioned was the occurrence of *Temnothorax interruptus* (it is considered rare among its relatives).

Most important results of the year 2018 in respect of nature conservation:

- The positive effects of habitat reconstruction activities can be seen in several project areas. The positive changes are especially significant in the case of Felső-Tápió (grassland restoration experiment), but the direction of change at Fóti Somlyó and Tétényi-fennsík are also appropriate. The increase in the species number and the increase of the relative frequency of the ground-dwelling spiders associated with natural habitats is the most important indicator.
- In many habitats, especially with loose soils, species number and diversity of ant communities have risen fairly compared to the previous year, owing to the population growth of xerotherm species. (This is the most typical ecological character of ants in these habitats.) This phenomenon could not be - or could be less - detected on hard, deep loess soils. Winter temperature and precipitation - both higher than average in winter of 2017/2018 - have likely effected these community dynamics. According to the data of years 2014-2018, a hypothesis can be evaluated that winter climate often may have greater influence on ant community structure than that of other seasons of the year (except for extreme weather events in any month, of course). In their active period of life, ant colonies can respond to weather events more effectively (with their moves or with active control of nest's microclimate, etc) than in winter, during their - more or less - inactive period. According it, xerotherm ant species may be more sensitive to the excess rainfall of winter months than that of other seasons (mortality

owing to the moistening of nest can be higher in winter). Negative effect of winter precipitation is more intensive on hard, deep loess soils, because of their slower desiccation. Nevertheless, warmer winter of 2017/2018 favored xerotherm species in quite a lot of habitats, where the effect of precipitation (mostly rainfalls) were lower, owing to favourable soil characteristics, namely better drainage and faster desiccation.

- In all three study sites of Küdői-hill the species number and diversity of ant communities have decreased (compared to previous year), however the dominance of *Lasius paralienus* (which is quite tolerant to disturbance) has strengthened. This ecological process differed from the trend of the majority of other communities. Community structures has not changed drastically even on Küdői-hill, but they referred somewhat more intensive local disturbing effect than weather events or negative competitive interactions. Probably the nature conservation management, the bush clearing with treading (or more intensive grazing, etc.) has influenced and disturbed these ant communities. Nonetheless, eradicating woody plants, as habitat management aiming to protect rock grasslands and slope steppes or to enlarge them to their former extent, does not disturb ant communities to an unacceptably great degree. Their effects such as temporary decreasing of community diversity, species number and total abundance of populations can be observed, but not much after the intervention the types and the ecological characters of affected communities correspond fairly well with those of control communities occurring in nearby natural grassland habitat patches. Moreover, presumably it will not be difference between them in a few years. Thus habitat management without considerable soil disturbance do not result in strong destruction of community structures, and its moderate effect seems to be not a bad price for the ecological and conservational advantages of the intervention, which emerge in a short time, on various levels of the whole biocoenosis.
- 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, proved to be stable on the time scale of study (for five years). It also confirms that the ant fauna of stable, natural habitats usually lives in strongly organized communities, which have quite repetitive structure, so they can be typify fairly well.