University of Sopron

Faculty of Forestry

Thesis of PhD dissertation

THE EFFECTS OF ARTIFICIAL GAP OPENING ON THE GROUND BEETLE FAUNA OF TWO FOREST STANDS IN VAS COUNTY

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Introduction

The number of insect species in our country is nearly 40 000, out of which 6350 belongs to the order of beetles (*Coleoptera*). So far the occurrence of 534 ground beetle (*Carabidae*) species have been detected in Hungary.

The most suitable organisms to reveal the effects of various agricultural and forest management techniques are the epigeic arthropods, especially the ground beetles and spiders. Both groups can be considered good indicators, since they react sensitively to various environmental impacts and anthropogenic interference. There are properly developed methods for their sampling and collection. The main method for monitoring ground beetle communities is pitfall trapping. With the help of pitfall trapping surveys, the composition and ecological parameters of ground beetle assemblages of a specific area are easily determinable.

In Hungary, the size of forest covered areas are 2,05 million hectares, and the forestation of the country is 20,9%. The principles of the 2009 XXXVII on Forest Conservation and Forest Management Act and its 2017 LVI amendment are organised around the concept of sustainable forest management. Increasing biodiversity and improving the naturalness of forests are at the forefront. The main goal in the implementation of near-natural forest management is to move from clear cutting forest management to single selection forest management. Converting forest management serves this purpose. The transition can be accomplished by a slow renovation process, which involves artificially creating gaps in the closed forest stock. The impacts of artificially created gaps on biodiversity have been less studied so far. My goal was to determine the effect of gaps on the ground beetle communities in two different forest stands (turkey oak, oak-hornbeam). For this purpose, I have been conducting pitfall trapping surveys for 2 years in the vicinity of two artificially created gaps (in the stand, in the edge and in the gap) in each forest.

Research Goals

I conducted my research in two gap-renewal affected forest subcompartments (oak-hornbeam: Bejcgyertyános 13A and turkey oak: Vép 32D), managed by Sárvár Forestry of Szombathely Forestry Corporation. Both subcompartments were also studied by the Sárvár Experimental Station of NAIK-ERTI. I matched my research with the network set up by NAIK-ERTI. This way, their measured parameters (soil moisture, light conditions, undergrowth cover, openness) have become comparable with my own trapping data. I collected samples on a two-week basis in 2013-2014. During my research, I was looking for answers to the following questions:

- The ground beetle fauna of Vas County is well explored, and several publications have been published in recent years. However, in the forests in the vicinity of the two settlements, no such research has been conducted yet. Thanks to my research, it was expected to trap some species, that were never before detected in Vas County. Another important element of the research is the detection of protected and rare species of fauna in Hungary.

    - What kind of ground beetle species live in the two survey areas?
    - Are there any new, never before detected species in the two survey sites?
    - Are there any rare and/or protected species in the two survey sites?

- According to my assumption, the less dry oak-hornbeam forest will have higher diversity values. There can be remarkable differences between dominance structures, since the forests most likely have different ground beetle fauna.

    - Which area (turkey oak or oak-hornbeam) has more variety concerning the ground beetle fauna?
    - Which are the dominant species? How does the activity of these species change in the survey years?

- I assume, that the formation of gaps increases the diversity of the ground beetles. Thanks to the gaps, even species that normally live in open habitats may be found in the area.. It can be assumed that generalist species will also occur in greater numbers. I used species saturation graphs to check if the number of samplings was sufficient. Diversity values are expected to be higher in the gaps.

- What impact does the formation of gaps have on the ground beetle fauna of the area?
- How do the characteristic ecological indicators (species saturation graphs, dominance values, diversity -, equitability values, diversity comparisons, species similarity indices) of each area develop?

● My assumption is that the specimen numbers caught in the forest stands and in the gaps will be similar, but there will be differences between the numbers of trapped specimens in the two habitats. It is expected that this difference between the two habitats can be confirmed by statistical methods.

- Is there a statistical difference between the individual trapping transects?

● Significant correlation between environmental parameters and the number of trapped species is expected. Openness and the relating light conditions, as well as undergrowth coverage showed the highest values in the middle of the gaps. The number of trapped ground beetles is expected to be higher in the forest stands. Soil humidity is also higher in the middle of the gaps, the species number of the caught beetles is expected to be higher in the gaps.

- Is there any correlation between measured soil moisture, light conditions, openness, undergrowth coverage, and the trapped ground beetle species data?

● Ground beetles use dead wood as a wintering and hiding place. Presumably the amount of lying dead wood in the areas will positively affect the number of trapped specimens.

- Is there a correlation between the trapping data and the quantity and quality of dead wood in the area?

Materials and methods

I conducted the surveys in the Bejcgyertyános 13A (not-dry oak-hornbeam) and Vép 32D (dry turkey oak) forest subcompartments, in four artificial 15 m x 30 m big gaps. I placed the traps along the longitudinal axis of the gaps, 5 m apart from each other. Each trap transect had 15 traps. I numbered the traps from 1 to 15, starting from the northern and the eastern ends of the transects. The samplings took place between April and November, in 2013 (15 times) and 2014 (16 times). The trapped specimens were assorted, identified and prepared at the Forest Management and Forest Protection Institute of the University of Sopron.

I compared the openness, light conditions and undergrowth data of the Sárvár Experimental Statin of NAIK-ERTI with my specimen number data. I adjusted the soil traps to the sample points set by them, so I could do the correlation tests with the environmental parameters actually measured along the traps. In addition, the distance from the middle of the gaps, the average body size of the beetles, and the amount of deadwood in the areas and their quality were also correlated with the trapped beetle data.

During the evaluation of the data, the sufficiency of the sample number was analyzed by species saturation graphs. I determined the dominance characteristics of the individual areas, on the basis of which I created the swarming curves of the 5 most dominant species of each area. The protected and rare species were analyzed separately in the faunistic part.

I analysed the rank abundance graphs, Shannon-Weaver diversity, Simpson diversity, and equilibrium values of the areas. To compare the diversities, I used Rényi's diversity arrangement. I used the Jaccard, Bray-Curtis, and Renkonnen indexes of the identity indexes. Based on Jaccard and Bray-Curtis similarity indexes, I have created the hierarchical cluster analysis dendrograms.

I used the Jaccard, Bray-Curtis, and Renkonnen species similarity indices. Based on the Jaccard and Bray-Curtis similarity indexes, I made dendrograms of hierarchical cluster analysis.

In the ordination analysis I applied non-metric multidimensional scaling using the Bray-Curtis similarity index.

In the canonical correspondence analysis, the 10-10 most dominant species of the two areas and the protected species of the two areas were correlated with the distance of the traps from the middle of the gaps, as well as the soil moisture, openness and undergrowth cover data, measured by NAIK-ERTI.

Correlation analysis was done to gain insight into the correlation between ground beetle communities and environmental parameters. Here, the trapped ground beetle data were correlated with the data about measured dead wood, the distance from the middle of the gaps, the average body size of the trapped beetles, and the measured soil moisture, openness, light, and undergrowth cover.

Result and conclusions

In the course of my research, 14 083 individuals of 73 species were detected, out of which 2 932 individuals were prepared. The collection is currently located at the Forestry and Forest Protection Institute of the Faculty of Forestry at the University of Sopron. During my research 10 protected, 6 rare and 2 new (to Vas County) species of ground beetles (*Amara anthobia*, *Ophonus gammeli*) were detected. The difference between the two years species and specimen numbers in the Bejcgyertyános area was not as big as in Vép. The species and specimen numbers were much higher in the Bejcgyertyános area. The number of specimens per sample and per trap were analyzed. Based on the two-year trapping of the two test areas, I compiled the species saturation curves. The curves flattened at the end of the second year of both researched areas, so there were a sufficient number of samples.

The analysis of the community and ecological characteristics was started by analyzing the diversity values of the trapped beetles in the areas. In the case of diversity values, I used Shannon-Weaver and Simpson diversity values as well as equitability. On the basis of the diversity indices and the equitability values, it can be stated that in most cases the values of diversity and equitability of the gaps were the highest (except in the case of the Vépi area at 2014). The peaks of the polynomial trend lines fitted on the graphs were approximately in the middle of each transect (i.e. gaps). To compare diversites, I used Rényi's diversity profiles. On the basis of the results, it can be stated that the opening of the gaps in both stands increases the diversity of the ground beetle fauna of the area.

There are two large groups regarding the species similarity indices (Jaccard, Bray-Curtis), the dendrograms of the hierarchical cluster analyzes based on them, and the ordination tests (Bray-Curtis). One group includes traps in the gaps, while the other group includes traps in the forest stand. The traps that we define as edge located are between the gaps' and the forest stand's traps in the case of the oak-hornbeam forest, whereas these traps in Vép are more similar to the traps of the forest stands. The Jaccard index takes into account the species number. Based on this, there is no difference between the species number of the gaps and the stand, so it is not suitable for further testing. The Renkonen index was used to compare the adjacent traps. Based on this, it can be shown very well that the similarity between adjacent traps is low at either end of the transects (in the stand), but gradually gets higher towards the middle of the gaps, where it is the highest. I also got higher values when comparing forest traps.

I adapted my research to the network set up by NAIK-ERTI's Sárvár Experimental Station. I trapped their most surveyed two gaps. This allowed me to correlate the trapped ground beetle data with their soil moisture, openness, light, and undergrowth cover data. I also correlated dead wood data (measured by me), body sizes and trap distances. On the basis of the correlation analysis, I identified a significant positive correlation between the number of trapped species and the distance from the middle of the gaps. There was a significant negative correlation between species number and soil moisture, openness, and measured light conditions. The amount of deadwood showed a significant positive correlation with the number of trapped species only in the area of Bejcgyertyános.

I carried out a canonical correspondence analysis with the most important environmental factors (soil moisture, openness, undergrowth cover, distance measured from the middle of the gaps), and with the protected species of the two areas. The *Bembidion lampros* and *Amara convexior* species showed a positive correlation with undergrowth cover, soil moisture, and openness in the case of Bejcgyertyános. The specimen number of these species was higher in the gaps than in the stand. The values of undergrowth cover, soil moisture and openness were also highest in the gaps. Conversely, these data show a negative correlation with the caught number of *Notiophilus rufipes*, because I trapped more of this species under the stands. There is a positive correlation between the distance from the middle of the gaps and the *Notiophilus rufipes, Pterostichus oblongopunctatus, Carabus convexus* and *Carabus hortensis* species. At the same time, the distance from the middle of the gaps show a negative correlation between *Bembidion lampros* and *Amara convexior* species.
In Vép, the distance from the middle of the gaps shows a positive correlation with the *Calosoma inquisitor*, and a negative correlation with *Amara convexior*. The number of *C. inquisitor* specimens has increased from the middle of the gaps towards the stand, whereas the number of *A. convexior* has increased in the gaps. *A. convexior* also shows positive correlation with openness data. In contrast, *Trechus quadristriatus* and *Notiophilus rufipes* have a negative correlation with openness. In the case of these species, the number of trapped specimens increases from the middle of the gaps towards the stand. Soil moisture and undergrowth cover data correlate positively with *Harpalus tardus, Molops elatus, Amara saphyrea* and *Carabus coriaceus* species. In contrast, *Calosoma inquisitor* and *Carabus nemoralis* have a negative correlation with these data. For these species, I trapped fewer individuals in the gaps, and more in the stands.

From a nature conservation point of view, the preference of gap supported forest renewal should be considered, if the site is suitable. On the basis of my research, it can be stated that small-scale gaps increase the diversity of the area (from a ground beetle faunistic point of view). A large clear cutting, while negatively impacting the area's ground beetle fauna, would also most likely cause the disappearance of large, flightless forest-specialist species from the area. From a forest management point of view, I also consider the gap supported forest renewal important, and where the site is inappropriate for this technique, tree retention groups should be formed. In these tree retention groups, the forest-specialist ground beetle species are more likely to survive, which allows us to increase the biological defense capacity of forests against pests.

Theses

1. Thanks to the effect of the gap opening, I trapped 12 618 individuals of 69 species in the oak-hornbeam area (Bejcgyertyános) (in 2013: 55 species, 6 077 individuals; 56 species in 6 541 individuals in 2014), while 42 species in the turkey oak area (Vép) 465 individuals (in 2013: 31 species 1 131 individuals; in 2014, 32 species 334 individuals). 2,932 specimens of the trapped ground beetles have been prepared, which is currently in the collection of the Forest Management and Forest Protection Institute of the Faculty of Forestry, University of Sopron.

2. The ground beetle fauna of Vas County is well explored, until the start of this research, 349 species were detected. During my research, with 2 new species (réti közfutó - *Amara anthobia*, Gammel-bársonyfutó - *Ophonus gammeli*), the species count of the detected ground beetles rose to 35. I have detected 10 protected (*Cicindela campestris, Calosoma inquisitor, Calosoma sycophanta, Carabus convexus, Carabus coriaceus, Carabus nemoralis, Carabus granulatus, Carabus hortensis, Carabus intricatus, Carabus ulrichii*) and 6 rare (*Bembidion obtusum, Poecilus lepidus, Amara cursitans, Amara equestris, Amara lunicollis, Ophonus gammeli*) species in the area.

3. In case of artificially opened gaps, due to the formation of open areas, the ground beetle species number becomes higher in closed forest

stands. The gaps show higher diversity than the closed forest stands. The diversities were higher in the gaps at both survey sites.

4. The diversity values (Shanon-Weaver and Simpson) of the less dry oak-hornbeam forest are higher than those of the turkey oak forest.

5. Summing up the trap data of the two study areas (dendrogram of cluster analysis based on Bray-Curtis similarity index, as well as the ordination test), it can be concluded that the ground beetle communities differ between the gaps and the forest stands. Due to the gap openings, a larger number of generalist (*Bembidion lampros*) and open habitat preferring (*Amara convexior*, *Cicindela campestris*) species appeared inside the gaps.

6. There was a significant positive correlation between the number of trapped beetle species and the distance measured from the middle of the gaps. In both areas, the traps located in forest stands, have larger specimen numbers than the ones located inside the gaps. From the middle trap (#8) outwards in the transect, we can find increasing specimen numbers in both directions.

7. Significant negative correlation values were found between trapped beetle species numbers and soil moisture data. During the measurement of the soil moisture of the gaps, higher soil moisture values were found in the middle of the gaps, while the fewest individuals were trapped here.

8. There was a significant negative correlation between trapped beetle specimen numbers and the measured openness values. Openness values were highest in the gaps. Due to the altered (increased) openness values inside the forest’s gaps, the number of individuals caught there is reduced.

9. I have found that the number of forest specialist species increases with the distance from the middle of the gaps, while the number of generalist

and open habitat preferring species decreases. The specimen number of the forest specialist species (*Carabus convexus, Carabus hortensis, Pterostichus oblongopunctatus, Calosoma inquisitor*) declined toward the centre of the gaps. Thus the farther a trap was located from the middle of the gap, the higher its catch numbers were. In contrast, open habitat preferring *Amara convexior* and generalist *Bembidion lampros* species had more specimens toward the gap centres.

10. Openness data were analyzed by canonical correspondence analysis. Open habitat preferring species (*Amara convexior, Bembidion lampros*) had a positive correlation, while forest inhabiting species (*Calosoma inquisitor, Carabus convexus, Notiophilus rufipes*) had a negative correlation with this factor.

Publications

MSc Theses and student research

Andrési D. (2015): Erdészeti jelentőségű fás növényeken megjelenő inváziós rovarok Magyarországon. Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Roth Gyula Erdészeti és Vadgazdálkodási Tudományok Doktori Iskola, Doktori Szigorlati Dolgozat, Sopron, 42 pp.

Andrési D. (2013): Madárökológiai vizsgálatok az ásotthalmi Tanulmányi erdőben. Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Természetvédelmi Mérnöki Szak, Szakdolgozat, Sopron, 73 pp.

Andrési D. (2012): Az ásotthalmi Tanulmányi erdő madárvilága, Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Erdőmérnöki Szak, Diplomamunka, Sopron, 56 pp.

Books and chapters in a book

Andrési D.; Kovács T. és Csóka Gy. (2014): 10. Gerinctelen ragadozók és parazitoidok. In: Csóka Gy. és Lakatos F. (eds.): Silva naturalis Vol.5. A holtfa. 97-108.

Lakatos F.; Tuba K.; Szabó I.; Varga Sz.; Sipos Gy.; Molnár M.; Sárándi-Kovács J.; Andrési D.; Némethné Pogány Cs.; Jambrich I.; Dankó T.; Csóka Gy.; Hirka A.; Janik G.; Szőcs L.; Kovács T.; Szabóky Cs. és Merkl O. (2014): A holtfa szerepe a diverzitás fenntartásában. In: Bartha D. és Puskás L. (szerk.): Silva naturalis Vol.6. A folyamatos erdőborítás megvalósításának ökológiai, konzervációbiológiai, közjóléti és természetvédelmi szempontú vizsgálata. A kutatási részprojektek szakmai beszámolói. Nyugat-magyarországi Egyetem Kiadó, Sopron. 148-164.

Peer-reviewed journal articles

Andrési, D.; Bali, L.; Tuba, K. and Szinetár, Cs. (2018): Comparative study of ground beetle and ground-dwelling spider assemblages of artificial gap openings. *Community Ecology* 19(2): 133-140.

Bali L.; Szinetár Cs.; Andrési D.; Tuba K. és Kálmán K. (2017): Talajcsapdás arachnológiai vizsgálatok az ásotthalmi Tanulmányi erdőben. *Erdészettudományi Közlemények* 7(1): 69-84.

Bali L.; Szinetár Cs.; Andrési D.; Kámpel J. és Tuba K. (2016): Mesterségesen kialakított lékek talajközelben élő pókfaunájának (Araneae) vizsgálata. *Növényvédelem* 52(6): 287-297.

Andrési D. és Lakatos F. (2014): Futóbogár-együttesek vizsgálata egy balaton-felvidéki mesterségesen kialakított lékben. *Erdészettudományi Közlemények* 4(1): 171-183.

Andrési D. (2013): Madárökológiai vizsgálatok az ásotthalmi Tanulmányi erdőben. *Erdészettudományi Közlemények* 3(1): 195-204.

Conference papers and proceedings

Andrési D. és Bárány G. (2018): Védett és fokozottan védett rovarok a Peszéri erdő területén – OAKEYLIFE LIFE16 NAT/HU/000599. In: Csiha I.; Csiha S. és Nagy A. (szerk): Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 74-78.

Bali, L.; Andrési, D.; Tuba, K. and Szinetár, Cs. (2018a): Comparing pitfall trapping and suction sampling data collecting for ground-dwelling spiders in relation of artificial gaps. In: Mezőfi, L. and Szita, É. (eds.): 31st European Congress of Arachnology: Final Program and Abstracts. Budapest, 35.

Bali L.; Andrési D.; Tuba K. és Szinetár Cs. (2018b): Betekintés a Kecskemét környéki erdők talajközeli pókfaunájába. In: Csiha I.; Csiha S. és Nagy A. (szerk): Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 110-111.

Bali L.; Andrési D.; Tuba K. és Szinetár Cs. (2018c): Szezonális változások egy nyugat-magyarországi cseres talajközeli pókfaunájában. In: Bidló A. és Facskó F. (szerk): Soproni Egyetem Erdőmérnöki Kar VI. Kari Tudományos Konferencia. 85-90.

Andrési D. (2017): Erdők egészségi állapotának változása a KEFAG Zrt. Dél-Kiskunsági Erdészetének területén. In: Csiha I. (szerk): Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 87-96.

Bali L.; Szinetár Cs.; Andrési D.; Tuba K. és Kálmán K. (2017): Az ásotthalmi Tanulmányi erdő talajfelszíni pók és futóbogár közösségeinek összehasonlítása. In: Csiha I. (szerk): Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 126-135.

Bali L.; Szinetár Cs.; Tuba K.; Andrési D. és Kálmán K. (2016a): Ritka és védett pókfajok előfordulása az ásotthalmi Tanulmányi erdő területéről. In: Lipák L. (szerk.): Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 43-48.

Bali, L.; Szinetár, Cs.; Tuba, K.; Ferka, R. and Andrési, D. (2016b): New occurrences of Atypus spider species. In: Ács, K.; Bencze, N.; Bódog, F.; Haffner, T.; Hegyi, D.; Horváth, O. M.; Hüber, G. M.; Kis, K. B.; Lajkó, A.; Mátyás, M.; Szendi, A.; Szilágyi, T. G. (szerk.) V. Interdiszciplináris Doktorandusz Konferencia Konferenciakötet: 5th Interdisciplinary Doctoral Conference Conference Book, Pécsi Tudományegyetem Doktorandusz Önkormányzat. 39-47.

Bali L.; Szinetár Cs.; Andrési D. és Tuba K. (2016c): Két év talajcsapdás mintagyűjtéseinek tapasztalatai egy nyugat-dunántúli erdő lékjeiben. In:

XVII. Magyar Pókász Találkozó 2016 Velencei-tó: Programok és összefoglalók Magyarország 5.

Bali L.; Andrési D. és Szinetár Cs. (2015): Folyamatos erdőborítást célzó kísérleti erdőterület lékjeinek pókfaunisztikai vizsgálata. X. Regionális Természettudományi Konferencia. Szombathely. 13.

Andrési, D. and Lakatos, F. (2014): The methodology of pitfall trapping and the ground beetle community of Zánka. ЛЕСА РОССИИ И ХОЗЯЙСТВО В НИХ 50 :22-25.

Andrési D.; Bali L. és Lakatos F. (2014): Talajcsapda vizsgálatok mesterségesen kialakított lékekben. IV. Kari Tudományos Konferencia: Konferencia kiadvány. Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Sopron. 312-315.

Horváth S.; Ali T.; Nagy J. és Andrési D. (2014): Vidéki munkahely teremtési lehetőségek feltárása az erdőgazdálkodásban a meglévő szakember-potenciálra építve. IV. Kari Tudományos Konferencia: Konferencia kiadvány. Nyugat-magyarországi Egyetem, Erdőmérnöki Kar, Sopron. 63-64.

Kelemen, G.; Tuba, K. and Andrési, D. (2013): Registračny list o strome: Three registry sheet. In: Pavel, Hrubík; Svetlana, Gáperová (szerk.) Dreviny vo verejnej zeleni : Zborník z konferencie s medzinárodnou účasťou Nitra, Szlovákia: Ústav ekológie lesa SAV Zvolen, 205.

Andrési D. (2012): Az ásotthalmi Tanulmányi erdő madárökológiai vizsgálata 2011-ben. In: Csiha I. (szerk.): Alföldi Erdőkért Egyesület Kutatói Nap, Püspökladány. 52-57.

Horváth, S. and Andrési, D. (2012): Analysis of Medium- and High-qualified Human-resources of Forestry in Hungary (1960-2010). In: Neményi, M; and Heil, B (szerk.) The Impact of Urbanization, Industrial and Agricultural Technologies on the Natural Environment : International

Scientific Conference on Sustainable Development and Ecological Footprint Sopron, Magyarország : Nyugat-magyarországi Egyetem, 1.

Horváth S. és Andrési D. (2011): Erdésztechnikusok és erdészeti szakmunkások munkaügyi adatai 1970-2010 között. In: Horváth B. (szerk.): Alföldi Erdőkért Egyesület Kutatói Nap, Sopron. 47-53.

Non-peer reviewed journals

Andrési D. és Koczka Z. (2019): A TAEG Zrt.-nél jártak a kecskemétiek. *Erdészeti Lapok* 154(2): 57.

Andrési D. és Koczka Z. (2018): Dr. Bárányi Lászlóra emlékeztünk. *Erdészeti Lapok* 153(10): 331.

Koczka Z. és Andrési D. (2018): Vas megyei barangolás. *Erdészeti Lapok* 153(2): 63.

Koczka Z. és Andrési D. (2017): A Kisalföldön jártunk. *Erdészeti Lapok* 152(10): 55.

Oral publications

Andrési D. (2019): Bács-Kiskun megye faállományainak kedvező hatása a klímaváltozásra. Fenntartható Energia és Klíma Akcióterv – SECAP, Kecskemét, 2019. március 28.

Andrési D. (2019): Bács-Kiskun megye faállományainak kedvező hatása a klímaváltozásra. Fenntartható Energia és Klíma Akcióterv – SECAP, Kiskőrös, 2019. március 21.

Andrési D. (2017): Erdészeti jelentőségű fás növényeken megjelenő inváziós rovarok Magyarországon. OEE Kecskeméti Helyi Csoport, Erdészklub, 2017. október 19.

Andrési D. (2016): Rovarok világa. Múzeumok éjszakája. Kecskemét, 2016. június 25.

Horváth B.; Andrési D.; Bali L.; Tuba K.; Tóth V. és Lakatos F. (2013): Az erdőszerkezet és az erdei növényzet hatása az erdei rovarközösségekre. Silva Naturalis – A folyamatos erdőborítás megvalósulásának ökológiai, konzervációbiológiai, közjóléti és természetvédelmi szempontú vizsgálata. A magyar tudomány ünnepe, „A természeti környezetökológiai szolgáltatásai”, Sopron, 2013. november 5.

Posters

Andrési D. és Bárány G. (2018): Védett és fokozottan védett rovarok a Peszéri erdő területén – OAKEYLIFE LIFE16 NAT/HU/000599. Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 2018. november 13.

Bali L.; Andrési D.; Tuba K. és Szinetár Cs. (2018): Betekintés a Kecskemét környéki erdők talajközeli pókfaunájába. Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 2018. november 13.

Andrési D. (2017): Erdők egészségi állapotának változása a KEFAG Zrt. Dél-Kiskunsági Erdészetének területén. Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 2017. november 2.

Bali L.; Szinetár Cs.; Andrési D.; Tuba K. és Kálmán K. (2017): Az ásotthalmi Tanulmányi erdő talajfelszíni pók és futóbogár közösségeinek

összehasonlítása. Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 2017. november 2.

Bali L.; Szinetár Cs.; Tuba K.; Andrési D. és Kálmán K. (2016): Ritka és védett pókfajok előfordulása az ásotthalmi Tanulmányi erdő területéről. Alföldi Erdőkért Egyesület Kutatói Nap: Tudományos Eredmények a Gyakorlatban. 2016. november 3.

Andrési, D. and Lakatos, F. (2014): The methodology of pitfall trapping and the ground beetle community of Zánka. IX. International Euroasian Symposion, Russia, Ekaterinburg. 2014. szeptember 23.

Andrési D.; Bali L. és Lakatos F. (2013): Talajcsapda vizsgálatok mesterségesen kialakított lékekben. IV. Kari Tudományos Konferencia, Sopron, 2013. december 10.

Horváth S.; Ali T.; Nagy J. és Andrési D. (2013): Vidéki munkahely teremtési lehetőségek feltárása az erdőgazdálkodásban a meglévő szakember-potenciálra építve. IV. Kari Tudományos Konferencia, Sopron, 2013. december 10.

Kelemen, G.; Tuba, K. and Andrési, D. (2013): Three registry sheet. Nitra, 2013. június 18-20.

Schiberna, E.; Lett, B.; Stark, M.; Horváth, S. und Andrési, D. (2012): Qualifikations- und Altersstruktur der forstlich Arbeitskraftspotenzial in Ungarn, Eine Studie zum Thema: forstliche Arbeitskraft heute und in der Zukunft, Freising, 2012. szeptember 17-19.

Andrési D. (2012): Az ásotthalmi Tanulmányi erdő madárökológiai vizsgálata 2011-ben, Alföldi Erdőkért Egyesület Kutatói Nap, 2012. november 9.