Proceedings of 29th Annual Meeting of DAGENE

Danubian Animal Genetic Resources

Volume 3 (2018)

DAGENE
International Association for the Conservation
of Animal Breeds in the Danube Region
1078 Budapest, István street 2.
Hungary

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"Ecosystems, products, conservation"

Proceedings of 29th Joint Annual Meeting of DAGENE and SAVE

in Kozárd, Hungary

from 24th to 27th of June 2018

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Supporting and advertising are possible at the office.

CONTENT
PROGRAM OF JOINT ANNUAL MEETING OF DAGENE AND SAVE
(Safeguard of Agricultural Varieties in Europe)

Event is held under the patronage of
Dr. István Nagy, Minister of Agriculture and
Dr. Miklós Beer, Bishop of Vác Diocese

The date of 29th Joint Annual Meeting of DAGENE and SAVE is from
24th to 27th of June 2018 (four days).

Place of Conference at the location of Village Centre, Fő út 12. (Main street No. 12)
3053 Kozárd, Hungary, degrees of latitude: 47.9158651 and longitude: 19.6203057.

The program contains is the following:

Sunday **24th June 2018**

- from 12:00 Arrival to Kozárd Village (http://www.kozard.hu)
Contact point and registration: Vadvirág (Wildflower) Restaurant, Fő út 29. (Main street No. 29), Kozárd
Lunch: in Vadvirág (Wildflower) Restaurant (optional)
Afternoon: Preliminary free discussions on various SAVE and DAGENE issues
Accommodation in rural tourism guestrooms in Kozárd and Alsótold

- 13:30 *Local Study Tour*:
  - Field visit (Kozard area, 4-6 km): harmonisation of ecosystem services with digitalization in agriculture (new approaches to protect/reinstate agro-bio diversity, creation and maintaining habitats for pollinator insects, bees and small game – land nesting birds e.g. grey partridge)

Free time excursions and leisure programs until 19.30
- Visit Hollókő UNESCO World Heritage Village and Castle (12 km) http://www.holloko.hu/
- Enjoy wellness treatment in Castellum Hotel, Hollókő (12 km) https://hotelholloko.hu/
- Visit Carpathian Hunting Museum and Castle in Hatvan (26 km) http://vadaszatimuzeum.hu/
- Visit Bükkszék Family Spa to enjoy Salvus Spring water to treat worn joints (57 km) http://www.bukkszekfurdo.hu/family_spa_center
- Visit Demjen Thermal Spa (80 km) www.termalfurdo.hu/

- 19:30 Dinner in Kozárd (Vadvirág (Wildflower) Restaurant)

Monday **25th June 2018**

7:30 - 9:00	Breakfast (Vadvirág (Wildflower) Restaurant) and Registration (Village Centre – Theatre; Fő út 12. (Main street No. 12)	
		page
9:30	***Opening of the DAGENE – SAVE Joint Annual Meeting*** (Village Centre - Theatre) *Greating of Prof. Dr. Pál Hajas, President of DAGENE* *Greating of Farkas Sándor, State Secretary* *Greating of Dr. Miklós Beer, Bishop of Vác Diocese* *Greating of Prof. Dr. Ricardo Cardellino, ex senior officer of FAO's Animal Genetic Resources Group* *In Memoriam Prof. Dr. Jean Boyazoglu (1937-2018)*	11
10:00 - 11:10	**SESSION I** *"Role of animal and plant genetic resources in ecosystems"* **Presentation of scientific papers** **Chair of the Session is Prof. Dr. Ante Ivanković (Croatia)**	
10:00	POSTA, János – HARDON, Daniella – MIHÓK, Sándor: **Pedigree analysis of the Hungarian Gidran Horse breeding population** (full paper)	13
10:10	RAMLJAK, Jelena – IVANKOVIĆ, Ante – DRŽAIĆ, Valentino – PEĆINA, Mateja – ŠPEHAR, Marija – KONJAČIĆ, Miljenko: **Genetic diversity determined by Microsatellites and Single Nucleotide Polymorphism Markers: case study of two native cattle breeds** (full paper)	19
10:20	CREANGĂ Ștefil – ȘONEA Cristinel – SIMEANU Daniel – DOLIȘ Marius Gheorghe – CUMPĂNĂȘOIU Ciceronis – BORȘ Silviu-Ionuţ – RADU Ciprian – DAVIDESCU Mădălina – CRIVEI Ioana – SĂNDULEANU Cătălina – DASCĂLU Dan-Lucian: **Research regarding the corporal development of young calves belonging to Grey steppe breed, as viable perspective for orientation of those breed to meat production** (full paper)	26
10:30	PODSTATZKY, Leopold – STARZ, Walter: **Fattening of lambs of different breeds on extensively grazed grassland – first results of possibilities and limitations** (full paper)	33
10:40	BECSKEI, Zsolt – PAVLOVIĆ, Ivan – SAVIĆ, Mila – TARIĆ, Elmin – DIMITRIJEVIĆ, Blagoje – GÁSPÁRDY, András: **The role of ecosystem service in conservation of autochthonous sheep breeds exposed to tick infections in Serbia** (full paper)	38
10:50 - 11:10	*Coffee break and poster session* PUSZTAI, Péter – SEREGI, János – CSAMBALIK, László: **Preserving and educating of traditional animal husbandry and our genetic heritage** (poster)	44

page

11:10 - 12:00 **SESSION II**

"Role of animal and plant genetic resources in ecosystems"

Presentation of scientific papers

Chair of the Session is Prof. Dr. Peter Chrenek (Slovakia)

12:10 - 13:00 ***LUNCH***

(Vadvirág (Wildflower) Restaurant) Kozárd, Fő út 29.

13:00 - 14:30 *"Choice of breeds to be conserved (in gene banks) – ethical questions"*

Presentation and discussion of the H2020 project IMAGE in group of SAVE and DAGENE participants

(Vadvirág (Wildflower) Restaurant 1st Floor Meeting Room) Kozárd, Fő út 29.

14:30 - 16:00 **SAVE Council of Cooperation Partners and Project Commission**

(Closed session, Integrated Community Centre) Kozárd, Fő út 47.

16:00 - 16:30 *Coffee break*

16:30 - 18:30	**DAGENE Annual Assembly** (Village Theatre)
17:00 - 18:00	**Meeting of the SAVE Arca Deli Award Jury** (Vadvirág (Wildflower) Restaurant 1st Floor Meeting Room) Kozárd, Fő út 29.
19:00 - 22:00	**Gala Dinner** (including traditional Hungarian Palinka and Wine Tasting) and **Arca Deli Award celebration** (Vadvirág (Wildflower) Restaurant) Kozárd, Fő út 29.

Tuesday **26th June 2018**

7:00 - 8:00	Breakfast (Vadvirág (Wildflower) Restaurant) Kozárd, Fő út 29.
08:15 -	**Study tour #1: Travel to Csákvár** (Transdanubia, 150 km)
10:30 -	Visit *Pro-Vértes Foundation*: preservation of ecological farming, indigenous breeds (cattle, buffalo, sheep, and donkey) and maintaining rich nature diversity of plants and wild birds (http://provertes.hu/)
13:00 -	***COUNTRY-STYLE LUNCH***
14:00 - 16:00	**SAVE Board of Directors meeting** (closed session)
14:00 - 16:00	Opportunities to see/taste traditional local deer and donkey products from a wild game reserve of *Bőszénfa* (*Kaposvár University*, West Hungary) and "Puszta tour": Opportunities to drive around on coaches to see the diverse natural landscape.
16:00 -	Last round of "Puszta tour" for SAVE BoD members
17:30 -	Travel by Bus to Kozárd via Budapest
18:30 -	In Budapest: Drive around the Royal Castle, Matthias Church at Buda Hill (http://www.matyas-templom.hu/; 60 km). Cross the historical Chain Bridge, look at the Parliament, then drive along the Andrassy Avenue, pass by Heroes' Square, Budapest
19:30 -	Drive to Kozárd (80 km)
20:30 - 22:00	**Dinner** (Vadvirág (Wildflower) Restaurant) Kozárd, Fő út 29.

The role of ecosystem service in conservation of autochthonous sheep breeds exposed to tick infections in Serbia

BECSKEI, Zsolt[1] – PAVLOVIĆ, Ivan[2] – SAVIĆ, Mila[1] – TARIĆ, Elmin[1] – DIMITRIJEVIĆ, Blagoje[1] – GÁSPÁRDY, András[3]

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Abstract

Sheep breeding represents one of the most perspective branches of the livestock production in Serbia. The specific climate and the unic habitat include a high variability of flora and fauna of grasslands, pastures and meadows throughout the country, ensuring high biodiversity of the ecosystem. Autochthonous breeds are most adapted to the local environment. The present study was performed on 143 autochthonous sheep breed flocks in Serbia during the grazing season from March to October 2016 and 2017, and included a total of 1069 adult sheep. Tick infection was detected in all tested flocks, affecting 49.02% of examined sheep. The most dominant was *Ixodes ricinus* (44.71%), followed by *Dermacentor marginatus* (30.40%), *Rhipicephalus bursa* (15.15%), *Ripicephalus sanguineus* (8.70%), *Hyalomma savignyi* (3.18%), *Haemaphysalis punctata* (2.81%) and *Dermacentor recticulatus* (2.62%). In tested years the recorded tick infections showed two peaks, in spring (April-May) and in autumn (September-October). The considerable difference between detected spring and autumn tick populations can be attributed mainly to climatic and environmental conditions of the ecosystem where ticks and sheep cohabitat.

Introduction

Sheep production has an old tradition in Serbia. Today it represents one of the most perspective branches of the livestock production of the country. The National programme of agricultural and rural development for the period of 2014-2024 puts important efforts on the improvement of sustainable agriculture and resource conservation. The climate and geographical conditions in Serbia are highly variable, resulting in high heterogeneity of ecosystems where sheep are raring (MILUTINOVIĆ et al., 1996). In central, southern, eastern and western regions, where mountain regions with abundant grasslands, pastures and meadows predominate, the extensive low input sheep production is practiced. On the north, in regions of flatlands, the intensive crop production with semi-intensive sheep management is applied. As all mentioned regions are geographically different, their ecosystems are also unique and diverse (JANKOVIĆ et al., 1973, 1984). The rational use of pastures in the period April-October makes the sheep production sustainable. The specific climate and the unique habitat include a high variability of flora and fauna of grasslands, pastures, meadows and fields of Serbia, ensuring high biodiversity of ecosystems. Tick populations are inevitable elements of specific biotop (MILUTINOVIĆ, 1992). A diverse tick fauna mainly influences

the health status of grazing ruminants (DIMITRIĆ et al., 1999; PAVLOVIĆ et al., 2009). Ticks are known as vectors for different diseases, some with zoonotic potential. However, as sheep and ticks share the same habitat, it is very difficult to avoid infections with different types of ticks that are contaminants of green areas. Tick infections are common, especially during late spring and autumn months (PETROVIĆ et al., 1996; MILUTINUVIĆ et al., 1998; ANDERSON and MAGNARELLI, 2008; PAVLOVIĆ et al., 2009).
This research was carried out in various ecosystems of Serbia, included 136 sheep flocks with a total of 1069 adult sheep, taking into account also the epidemiological importance of tick infections.

Material and methods

The present study was performed on 136 flocks of autochthonous sheep breeds in Serbia. The prevalence and biodiversity of ticks were analysed during the grazing season, in the period of March to October, in 2016 and 2017. A total of 1069 adult sheep were observed for the presence of tick infection. The following parameters were considered: biodiversity, relative abundance and sex ratio of tick populations of the observed ecosystems enhabited by sheep, taking into account the seasonal climate changes.
Ticks were collected by removing them from sheep with tweezers and were placed in vials with 70% ethanol. Determination of species and sex of the collected ticks was done using standard morphometric characterization given by POMERANCEV (1950), KAPUSTIN (1955) and KOLONIN (2009).

Results and discussion

Ticks were present in all 136 tested sheep flocks in different geographical regions and ecosystems of Serbia. Infection was detected in 496 (49.02%) out of 1069 examined sheep. A total of 4080 tick specimens were collected. Seven tick species were determined, all from the Ixodidae family. Sex ratio was as follows: 2151 females and 1929 males. As it is shown in the Figure 1, the most frequent species was *Ixodes ricinus* (44.71%), followed by *Dermacentor marginatus* (30.40%), *Rhipicephalus bursa* (15.15%), *Ripicephalus sanguineus* (8.70%), *Hyalomma savignyi* (*Hyaloma marginatum*) (3.18%), *Haemaphysalis punctata* (2.81%) and *Dermacentor recticulatus* (2.62%).

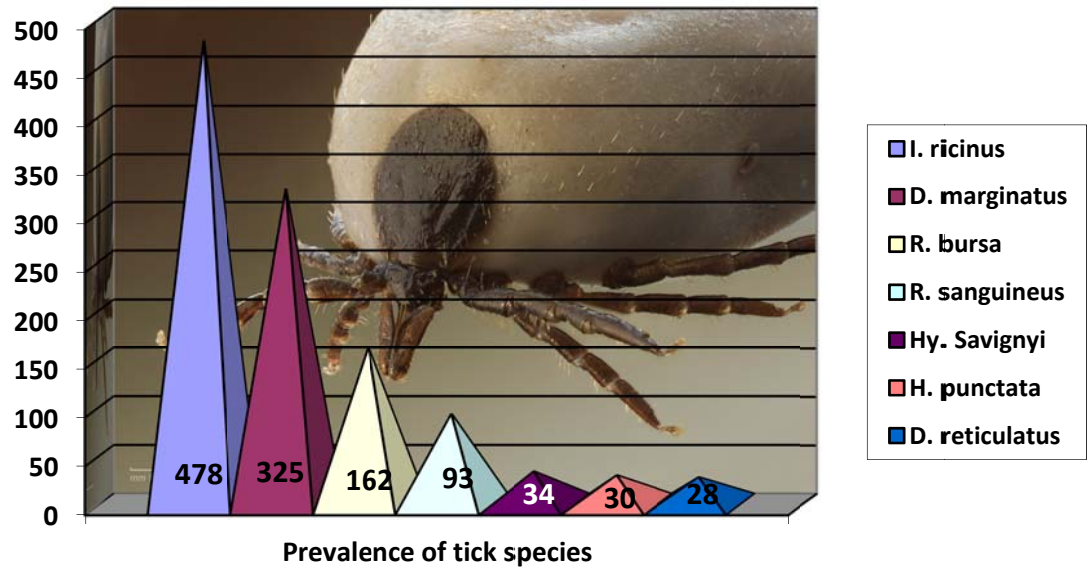

Figure 1. Biodiversity and prevalence of ticks detected

Sex ratio of detected tick species showed a higher number of females in four species (*I. ricinus, H. punctata, R. sanguineus* and *D. marginatus),* while higher number of males were detected in two species *(R. bursa* and *Hy. savignyi*), and an equal number of ticks in *D. recticulatus.*

Comparison of the obtained results with findings of previous similar surveys of tick diversity in Serbia, indicated that there is a great similarity in the established results. Examination performed in sheep on eastern, north-eastern, western and southern parts of Serbia (MIŠČEVIĆ et al., 1995; PAVLOVIĆ et al., 1995; MILUTINOVIĆ et al., 1996; PAVLOVIĆ et al., 2013, 2014; BECSKEI et al., 2015; PAVLOVIĆ et al., 2016) pointed to the presence of almost the same tick species, including *I. ricinus, Hy. savignyi*, *H. inermis, Boophilus calcaratus* and *Ornythonisus lachorenis.* Similar results were established in Belgrade area and north-west parts of Serbia (Mačva district) where *I. ricinus. R. sanguineus, D. pictus* and *D. marginatus* were detected as most abundant species in small ruminants (MILUTINOVIĆ et al., 1987, 1996; PAVLOVIĆ et al., 2013, 2016; BECSKEI et al., 2015).

It is well known that climate conditions have the major influence on the seasonal population dynamics of ticks. The most important are temperature, relative humidity and rainfall (PETROVIĆ et al., 1996; MILUTINOVIĆ et al., 1998). In the present study, the population dynamics of tick infections was monitored from March to October. They showed two annual peaks, in spring (April-May) and in autumn (September-October) in the tested years. March was a period when the grazing season started and it overlapped with the occurrence of *I. ricinus, H. punctata* and *D. marginatus.* During April the following ticks species were found, presented in order to their prevalence: *I. ricinus, R. sanguineus, D. marginatus* and *Ha. punctata.* In May, *I. ricinus, D. recticulatus, R. bursa* and *Hy. savignyi* were observed. In June, a population peak was observed for *R. sanguineus*, which is the most common species both in July and August. Autumn population peak were observed in September in two species of ticks: *I. ricinus* and *D. marginatus*, while in October the most abundant tick populations observed were the following: *H. punctata, R. sanguineus* and *R. bursa.* In October *D. marginatus* and *D. recticulatus* were rarely detected. The considerable seasonal changes of tick populations detected in spring and autumn can be attributed mainly to climatic and environmental conditions in all ecosystems where ticks and sheep cohabitat. Biodiversity and seasonal distribution of ticks detected in this survey correlates with results of other authors in

the region of the Western Balkans, the Mediterranean region and Central Europe (RIVOSECCHI et al., 1980; L'HOSTIS et al., 1995; PAPAZAHARIADOU et al., 2003; HORNOK, 2009; ESTRADA-PENA et al., 2011; OMERAGIĆ, 2011; MIHALCA et al., 2012).

These findings are of valuable epidemiological importance because it is wellknown that tick populations are potential vectors for infective agents such as *Borrelia burgdorferi, Erlicihia spp., Anaplasma spp.,* and some viral vector-borne diseases and zoonoses such are tick-borne encephalitis, haemorrhagic fewer, etc. (NUTTALLl and LABUDA, 2008).

Results of the present study also necessitate further investigation of the characteristics of health, tolerance and resistance to tick infections, considering breed and individual genetic variations in sheep in various regions of Serbia. Resistance or tolerance to tick infections, and to a lesser extent to tick-borne diseases, are well documented, especially in cattle breeds (SAMISH, 2008; BISHOP et al., 2010). Autochthonous breeds adapted to local ecosystems are much more tolerant to parasite infections than exotic breeds. Results of DIMITRIJEVIĆ et al. (2012) showed higher susceptibility for parasitic infections of exotic sheep breeds compared to autochthonous Zackel sheep types.

Conclusion and recommendation

Sheep production is an example of a sustainable production, fully integrated in local rural development. One of the main threats on the outdoor breeding of sheep is parasitism. Based on the obtained results, it can be considered that tick infections represent a significant epizootiological issue of sheep production in Serbia. The method of sheep rearing allows permanent tick infections in sheep, and climatic conditions favor their development and maintenance on grazing surfaces of various ecosistems. Fauna, seasonal dynamics and sex ratio of ticks do not differ much from results obtained in the neighbouring regions. In tested years the population dynamics of recorded tick infections showed two annual peaks, in spring (April-May) and in autumn (September-October). The considerable differences between detected spring and autumn tick populations can be attributed mainly to transition of climatic and environmental conditions of ecosystems where ticks and sheep cohabitat. As tick infections have epizootiological and epidemiological importance and causes direct and indirect economic losses, it is necessary to undertake more detailed strategies for antiparasitic management of ecosystems where sheep are reared.

Acknowledgements

This research work was carried out with the support of Ministry of Education, Science and Technology Development and was financed by Project TR 31053 and TR 31085.

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