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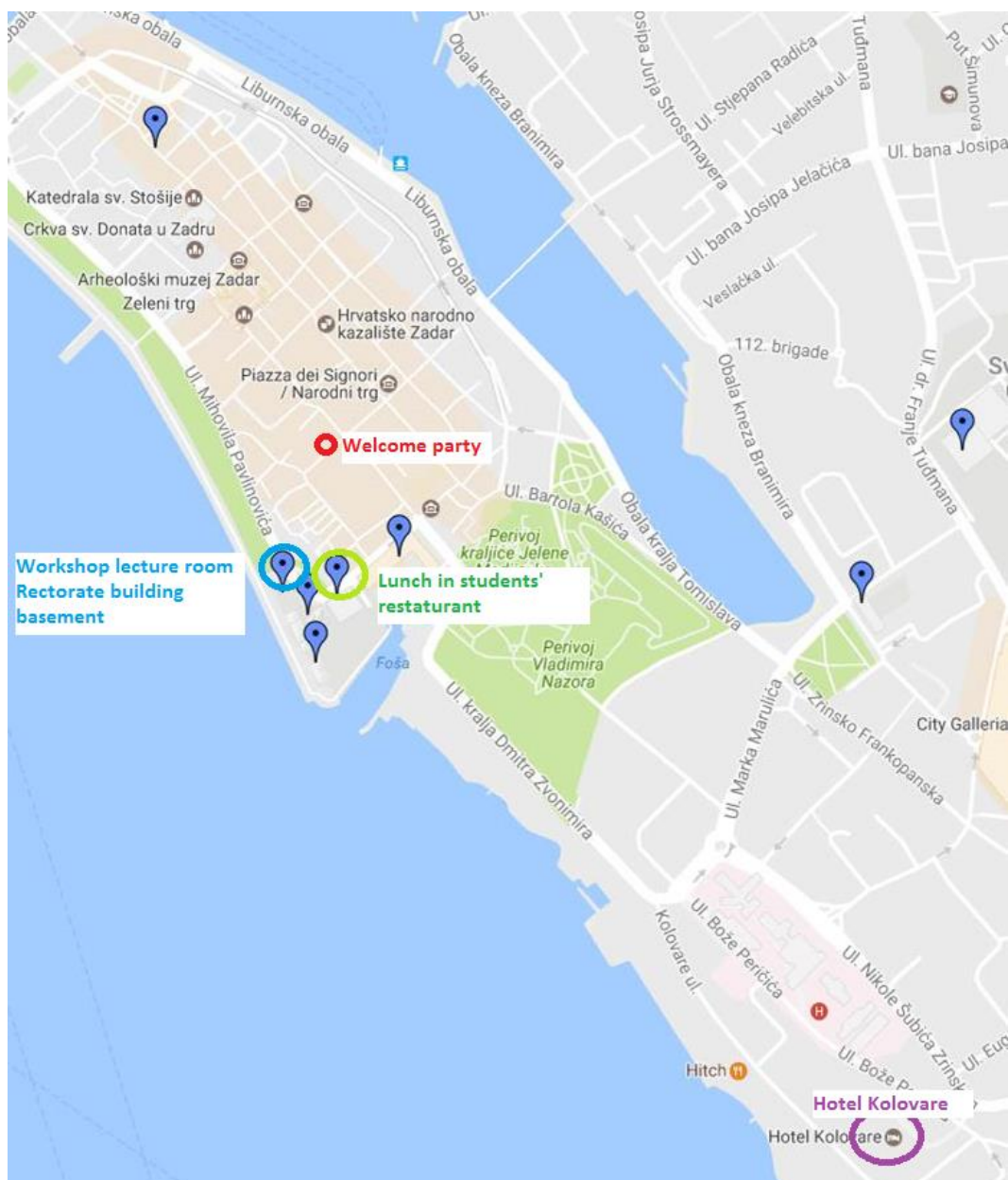


University of Zadar;
Department of ecology, agronomy and aquaculture, Zadar, Croatia

“2017 COLOSS MONITORING WORKSHOP”



Zadar, Croatia, 1th – 2th February 2017



Workshop lecture room is in the main building of rectorate. Mihovila Pavlinovića bb

Lunch is in the next building in the same street.

Welcome party is in the small friendly place “cafe bar and gallery Gina” in Varoška ulica 2.

Local contacts:

Janja Filipi 00 385 91 3881 117

Maja Dražić 00 385 98 704 125

2017 COLOSS MONITORING WORKSHOP AGENDA

31st January 2017	Arrival	
19:00	Welcome party	
1st February 2017		
9:00 – 9:15	Registration	
9:15 – 10:30	Session 1	Welcome Organizational matters Robert Brodschneider: Overview on COLOSS monitoring group
10:30 – 11:00	Coffee break	
11:00 – 13:00	Session 2	Janja Filipi: Introduction to beekeeping in Croatia Maritta Martikkala: Great variation in different methods on monitoring winter losses in Finland Flemming Vejsnæs: Survey on how we can improve dissemination of information to the beekeepers. Cooperation between monitoring group and B-rap
13:00 – 14:30	Lunch	
14:30 – 16:00	Session 3	Questionnaire
16:00 – 16:30	Coffee break	
16:30 – 18:00	Session 4	Questionnaire (if needed) Data quality
19:30	Social dinner – City centre	
2nd of February 2017		
9:30 – 13:00	Session 5	Grazyna Topolska: Temporal and spatial pattern of winter honeybee colony losses in Poland in the period between autumn 2006 and spring 2012; survey based on self-selected sample Victoria Soroker: Colony losses in Israel summer 2015 and winter 2016 Raquel Martín-Hernández: Monitoring bee losses in Spain: 2016
10:30 – 11:00	Coffee break	
11:00 – 13:00	Session 6	Varroa project and other papers in production
13:00 – 14:30	Lunch	
14:30 – 16:00	Session 7	Open session
16:00 – 16:30	Coffee break	
16:30 – 18:00	Session 8	Open discussion, next workshop, outstanding points and other issues Closing the workshop
19:30	Guided tour Zadar	
3rd of February 2017	Technical visit National park Plitvice lakes area, meeting with beekeepers. Lunch on the site.	

Oral presentations

Janja Filipi	Introduction to beekeeping in Croatia
Maritta Martikkala	Great variation in different methods on monitoring winter losses in Finland
Victoria Soroker	Colony losses in Israel summer 2015 and winter 2016
Flemming Vejsnæs	Survey on how we can improve dissemination of information to the beekeepers. Cooperation between monitoring group and B-rap
Grazyna Topolska	Temporal and spatial pattern of winter honeybee colony losses in Poland in the period between autumn 2006 and spring 2012; survey based on self-selected sample
Raquel Martín-Hernández	Monitoring bee losses in Spain: 2016

Abstracts

Introduction to beekeeping in Croatia

Janja Filipi

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Beekeeping in Croatia is characterized by variability in climate and vegetation due to geographic position and relief, but also in variability of beekeepers regarding their education, age and the number of colonies. Currently there are more than 12 000 beekeepers registered that keep over 550 000 honeybee colonies. Majority of managed honeybee colonies is distributed in continental Croatia, followed by Mediterranean, and the lowest number of colonies is in Mountain region (Lika and Gorski Kotar). Carniolan bee (*Apis mellifera carnica*) is naturally distributed all over Croatia. Colony losses are reported yearly and their intensity is variable depending on year and region. However, data on losses are collected using COLOSS questionnaire since 2009 with different success and rate of responses over the years.

Great variation in different methods on monitoring winter losses in Finland

Lassi Kauko

Maritta Martikkala

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There are three surveys: Beekeepers' association is sending every autumn to 10 % of randomly chosen members questionnaire about honey yield. Since 1993 association has been asking about the overwintering of the previous winter. Return rate has been about 70 %. Answering can be made anonymous. In the association the survey is made by Vartiainen.

Kauko started winter 2007-2008 to ask about overwintering with personal contact. The same beekeepers are interviewed every year. From the first 30 beekeepers 28 are still in the group, which now consists of 44 beekeepers from all parts of Finland the majority being anyway from southwest.

Seppälä started 2 years ago survey through internet. In the survey of association the number of bee colonies has been over 2000, in surveys of Kauko and Seppälä in last years over 5000 with some overlapping in these surveys. The number of overwintered colonies in Finland is about 50000.

In spite of different samples of beekeepers the loss rate have been in every survey almost same, in most years between 15 and 20 % $\pm$ 1 % with exception of the winter 2008-2009 when result from Kauko's survey was 13,8 % and from survey made by association 18,3 %. In the winter 2013-14 losses were much smaller than in previous years, in all surveys they were about 7 %.

Other results: beekeepers of southern Finland are continuously suffering greater losses than the northern ones. Beekeepers who are losing over 50 % of colonies during the winter tend to need at least 2 years to achieve same number of colonies as before big loss. Observations of causes cannot be obtained from all beekeepers. Usually information is got from about half of the losses. Major causes are same as in other countries: queen failures, varroa, starvation. Smaller amount of colonies die because of birds, vandalism, storms, bears etc. When bees overwinter well seems the proportion of queen failures be bigger than that of starvation or varroa smaller.

Colony losses in Israel summer 2015 and winter 2016

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Honeybees wellbeing is crucial for intensive agriculture. In order to follow annual colony losses and in attempt to isolate main risk factors, we conduct a survey among beekeepers mainly via an internet questionnaire. The COLOSS questionnaire was used after translation with a few additional questions. The survey addressed losses during the winter 2015-16 and summer 2015. Beekeepers were mainly asked about: levels symptoms and major timings of colony losses, monitoring for Varroa and Nosema, treatment times and treatments methods against Varroa and Nosema. This year only 57 beekeepers participated in the survey, still representing a third of the total number of bee colonies in the country. These were beekeepers representing different operation sizes from migratory beekeepers with 5000 colonies to backyard beekeepers keeping just a few colonies. The questionnaire is still not perfect; in particularly questions that ment to classify losses and queen problems remain difficult to the growers as queens are rarely marked and colony losses are still poorly recorded. Question regarding comb changes may also be problematic, as judged by surprising finding that higher summer losses was found to be associated with more than 30% of brood combs. Overall average winter colony where 10%, while spring-summer losses were 20%. Clearly indicating the significance of summer losses. No increase in winter loss or summer losses was observed in comparison to former year. Although practically all the colonies were treated against Varroa, the treatments varied in timing, numbers of applications and techniques. The treatment prescribed by the extension services is locally made Amitraz loaded wooden sticks (Galbitraz). Most of the beekeepers use it along with Amitraz smoking procedure. Small operation beekeepers were found very "creative" using a variety of Varroa control methods. The fact that most beekeepers noticed deformed bees in their hives despite treatments against Varroa mite indicates that the mite and the viruses it vectors remain the major problem. Like in previous year another risk factor appears to be Nosema. Significantly higher for summer losses but not winter losses were observed among the large operation beekeepers that haven't treated against Nosema. In small operations no such relation was noticeable. We plan to continue the survey in the coming year.

**Survey on how we can improve dissemination of information to the beekeepers.
Cooperation between monitoring group and B-rap**

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The COLOSS core workgroup B-rap was initiated at the COLOSS meeting in Murcia. Lot of subjects, ideas and expectation is put on this group. One of the main task is: “ensuring that learning & understanding generated reaches the beekeepers and leads to modified practice”. Or very short, how do we reach the beekeepers. One of the tasks of the group is to define our target group: The beekeeper society. Therefore this year we intend to make a survey on how we can improve dissemination of information to beekeepers. Questions in the questionnaire are so far the following: Country, type of beekeeper, number of colonies, age, gender, education, beekeeper education, beekeeper for how long time, are you member of an association, do you read beekeeper magazine, do you join meetings, what kind of need do you see is necessary, how do you want to get more information etc. It will be a questionnaire that we want to distribute to all COLOSS member countries and especially the ones taking active part in the colony losses monitoring. In this group there is a good logistical system for distributing questionnaires. We want to use the online survey program LimeSurvey, where we will put up an English version, get it translated to the relevant languages and then distributed to the monitoring group in the different countries. We hope very much that the monitoring group agree on cooperating in this very important task. We also kindly invite members of the monitoring group to become active members of the B-rap group. Next B-rap meeting will take place in Bologna (22th-23th march), Italy in connection with the varroa task force group (21th-22th march). For further information see the COLOSS homepage or contact Flemming Vejsnæs (fv@biavl.dk) or Preben Kristiansen (preben.kristiansen@biodlarna.se).

Temporal and spatial pattern of winter honeybee colony losses in Poland in the period between autumn 2006 and spring 2012; survey based on self-selected sample

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Researches from the Warsaw University of Life Sciences surveyed the level of honey bee colony losses in Poland using a preliminary questionnaire in 2008 and, from 2009, the standardized COLOSS questionnaire. In 2008 the preliminary questionnaire (concerning two winters: 2006/07 and 2007/08) was distributed among participants and collected again at various meetings and conferences with the active help of beekeeping associations. From 2009 to 2012 the multimode way of data collection was used.

In total we received from 340 to 740 questionnaires each year. About 10% of questionnaires arrived after the deadline.

The highest overall losses (18.3%) occurred during the winter of 2010/2011. However each year, apart from the winter of 2010/2011, at least 50% of beekeepers reported an acceptable level of losses (up to 10%).

The overall losses in particular voivodeships varied from year to year. To create maps with losses in voivodeships, the data from beekeepers who owed exceedingly high number of colonies, compared with the average for the region, were removed (outliers). Analysis of losses experienced by the remaining beekeepers showed that in each successive year fewer voivodeships had low losses (up to 10%).

To analyze the location of the apiaries with losses above 15 % the data from beekeepers owing above 20 colonies were used.

It would be interesting to use the statistical model developed by Switanek and coauthors (2017) to check correlations between monthly climate variables and winter mortality rates in Polish climate conditions.

Monitoring bee losses in Spain: 2016

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As in previous years, COLOSS Questionnaires were disseminated during 2016 to estimate the colony losses in Spain. The dissemination of the questionnaires was made by asking collaboration through beekeepers associations and during meetings. We also had the Robert Brodschneider's help (Institute of Zoology, University of Graz, Graz, Austria) who kindly made us available an on-line Spanish version of the questionnaire that some beekeepers used.

In this survey, a total of 113 beekeepers answered the questionnaire (30 of them were answered on-line), that represented less than 1% of total beekeepers in Spain. Only some regions of the country were represented since the most of beekeepers had the colonies in the Autonomous communities of Madrid, Castile - La Mancha, Castile – Leon, Aragon, Asturias and Galicia (Central, North and North-West of Peninsula Iberica). The analysis of the results showed a colony mortality rate of 15.4% in the represented areas. Transhumance was an activity declared by the 28.6% of the participant beekeepers and the most of them did not have a significant flow on OSR (85.6%) or maize (91.5%). Surprisingly, around a 4% of beekeepers reported not to treat against Varroa failing to observe the sanitary rules in the Country. The most used product declared to control varroa infestation were amitraz, coumaphos and oxalic acid (in this order).

New methods to improve the dissemination of the questionnaire should be developed to increase the number of beekeepers collaborating in these surveys. A higher dissemination of on-line questionnaires will be tried in the upcoming surveys.

Monitoring of winterlosses of honey bee colonies in Austria 2015/16

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Winter losses of honey bee colonies are surveyed in Austria – in the framework of the international research network COLOSS – since nine years in a row now. 1289 beekeepers with a total of 23418 wintered colonies participated in the year 2016. 1897 of these wintered colonies were lost during the winter 2015/16 or had unsolvable queen problems. This is equivalent to a loss rate of 8.1 percent (95% confidence interval: 7.4-8.8%), and which, in turn, is the lowest winter loss rate in Austria since the onset of our investigations in 2007/08. Answers of beekeepers were checked for representativeness by comparing the loss rates of anonymous and non-anonymous participants, of beekeepers participating online and via paper-pencil questionnaire, and of different sizes of operation. We conducted analysis regarding the geographical distribution of losses, the accompanying symptoms of these winter losses, and the mode of operation. Loss rates differed according to operation size, the sea level, and the availability of melliferous plants such as maize, oilseed rape, buckwheat and sunflower. Furthermore, we evaluated different treatments used for colony sanitation. From this we recommend to treat against *Varroa destructor* using formic acid and/or thymol and/or oxalic acid (including Bienenwohl®) and combine this with an annual renewal of more than 50 percent of brood combs. This combination seems to be most successful in reducing winter losses at least in winters with low loss rates. Based on our results we conclude that the causes of winter losses of honey bee colonies are multifactorial, influenced by environment and hive management.

Occurrence of *Aethina tumida* in Italy and management options

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Aethina tumida Murray, the small hive beetle (SHB), adults and larvae were firstly reported in Italy in September 2014 in honey bee nucleus colonies near the Gioia Tauro port in the region of Calabria (southern Italy). In November 2014, a single infested apiary was found in Sicily. Genetic analyses revealed the African origin of SHB introduced into Italy. Early reaction measures adopted in Italy require immediate notification of SHB detection to the local veterinary services, movement restriction of the concerned colonies and apiaries, destruction of infested apiaries and ploughing and pyrethroids treatment of the surrounding soil. 130 positive sites in the region of Calabria and one in Sicily were detected and destroyed between 2014 and 2016. The Ministry of Health granted compensation to beekeepers according to the law in force. Furthermore, a protection (20 km radius) and a surveillance (100 km) zone were established; later the surveillance zone included the whole territory of Calabria region. In Sicily, a protection zone of 10 km was established around the infested apiary. Compulsory visits to all apiaries in the protection zone with georeferentiation and visual colony inspection according to 5% expected prevalence (95% CI) are applied. In the surveillance zone, apiaries are selected randomly or according to risk analysis and colonies are inspected according to 2% expected prevalence (95% CI). Sentinel honey bee nucleus colonies were installed to improve SHB detection in the protection zone and around it. Furthermore, a national SHB surveillance program was carried out in spring and autumn 2015 and 2016. No SHB has been detected outside the two concerned regions. A similar surveillance program will be implemented in 2017 adding sentinel honey bee nucleus colonies around the main ports in relationship with wood import from Africa. Future perspectives of containment are discussed.

Review of the work and dissemination of findings of the COLOSS monitoring group in 2016

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The network of countries participating in monitoring of colony losses remains strong. In 2016, 29 countries sent data from their monitoring survey to the international data co-ordinator for inclusion in the data analysis. Turkey and Belgium both contributed data once more after a few years of absence, and Wales provided data from a new survey.

Several avenues were pursued in 2016 for publishing the results of the COLOSS annual colony winter loss survey. A press release with preliminary results for winter 2015-16 was issued in late July 2016, as has been done for several years. This attracts considerable international attention through the media and the internet.

A new initiative was started in 2016, to establish an annual series of jointly authored short papers to be submitted in late summer/early autumn. These would present winter loss rates from countries submitting data returns in the requested form to the data co-ordinator by the specified deadline for that year's survey. The first paper, entitled "Preliminary analysis of loss rates of honey bee colonies during winter 2015/16 from the COLOSS survey", appeared in the Journal of Apicultural Research online in December 2016 and has already been widely read. In future a press release is likely to follow rather than precede this annual paper.

Discussion at and prior to the COLOSS conference in September 2016 in Cluj-Napoca, Romania, proposed use of data collected on varroa treatment as part of the monitoring questionnaire, not as a potential explanatory factor in winter losses but in a descriptive analysis comparing beekeeper practice in participating countries. This analysis is underway at the time of writing. The results will also be of interest to the COLOSS varroa group.

Two further papers are still in preparation. One is a modelling-based paper on risk of winter loss, covering a period of 5 years and incorporating both varroa treatment factors and environmental variables, and another is a descriptive paper presenting loss rates over time and space, for the study of patterns of losses.

A ResearchGate collaborative project was set up in late December 2016 by Robert Brodschneider, entitled "COLOSS monitoring of honey bee colony losses", as a means of enhancing visibility of the work of the monitoring group, and also for attracting interest from potential national co-ordinators in countries not yet represented in the group. In just over a month, this has already gained more than 50 followers.

List of registered participants

Last name	First name	Institution	Town/City	Country	E-mail
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About Zadar

Zadar, a city of exceptional history and rich cultural heritage, a city of tourism. Situated in the heart of the Adriatic, Zadar is the urban center of northern Dalmatia as administrative, economic, cultural and political center of the region with 75,000 inhabitants. The coast is particularly indented, the islands and the untouched nature allures many boaters to this regions. The archipelago counts 24 bigger and about 300 smaller islets and rocks, 3 nature parks - Telašćica, Velebit and Vransko jezero and 5 national parks - Paklenica, Plitvice lakes, Kornati Islands, Krka and Sjeverni Velebit classifying Zadar and its surroundings at the very top of the Croatian tourist offer. Zadar is a city monument, surrounded by historical ramparts, a treasury of the archaeological and monumental riches of ancient and medieval times, Renaissance and many contemporary architectural achievements such as the first sea organs in the world.

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