

**4th Coloss conference
Prevention of Colony Losses**

3-4 March 2009

Zagreb

Working Group 4: Diversity and Vitality

Participants: Bienkowska, Malgorzata; Bouga, Maria; Büchler, Ralph; Costa, Cecilia; Drazic, Maja; Hatjina, Fani; Ivanova, Evgenija; Kezic, Nikola; Kryger, Per; Meixner, Marina; Mirjanic, Goran; Mladenovic, Mica; Moritz, Robin; Murilhas, Antonio; Panasiuk, Beata; Sekulja, Domin, Stanisavljevic, Ljubisa; Uzunov, Aleksandar; Wei, Shi; Wilde, Jerzy;

Working Group Aims

- 1) Development of Standardized Breeding Protocol including Parameters of Vitality**
- 2) Investigation of Genotype-Environment interactions**
- 3) Collection of reference information on Biodiversity**

Agenda of the Zagreb meeting

- 1) Biodiversity
- 2) Draft for breeding protocol
- 3) Genotype environment interactions experiment
- 4) "Working group mix"
- 5) Review papers

For each of the discussion topics in the agenda we discussed 1) what progress had been made since the previous meeting (September 2008); 2) what activities we foresee for the coming season; 3) use of COST instruments such as workshops; 4) intention of each member to participate in the different aspects.

1) Biodiversity of honeybees in Europe

AIM: to consolidate the currently available knowledge on biodiversity of honey bees.
(for further information refer to Minutes of III Coloss meeting, Belfast, September 2008).

We decided to postpone the literature search and classification of documents into a suitable format until next winter. New deadline for collection of information: January 10, 2010.

Marina and Cecilia reported that during the Executive Committee meeting Peter Neumann referred that Tony Imdorf, recently retired from Liebefeld Bee Research Institute in Switzerland, has made available a Reference Manager file containing 15000 references. Yves Le Conte also mentioned a file available on Footnote. During the plenary session it was suggested to organize a workshop to exchange and/or integrate such files into a single database, which may contain references of interest to WG4.

2) Parameters of vitality: draft for breeding protocol

AIM: to integrate vitality parameters into a commonly accepted protocol for colony evaluation.

A draft protocol based on criteria that are currently in use in different countries (Annex 1) was discussed, including a table compiling the different ways of measuring such parameters (Annex 2). Ralph Büchler suggested that the number of colonies present in a breeding yard should also be considered. At least in the case of Varroa infestations, it is known that re-infestation from collapsing colonies can occur and lead to domino effects. The importance of threshold levels of infestation was discussed and defined as the mite level above which the colony will not survive the following winter without treatment. The state of knowledge relating to threshold levels in other diseases, such as Nosema, was also discussed.

3) Genotype-environment interactions

AIM: estimation of genotype-environment interactions on colony losses and establishment of adequate testing standards tailored for different climatic conditions

Ralph Büchler presented the experimental plan (Annex 3). Details of the experiment were intensively discussed. The main results are presented below.

Each participant (location) should evaluate at least 10 colonies x 3 strains (=30 colonies). At least 3 major colony evaluations (spring, summer and autumn) should be carried out. A standard evaluation protocol will be applied in all locations, including characters relating to development, productiveness and disease tolerance. The methods will be communicated in a workshop (see below). Varroa population development will be monitored by measuring mite infestation at beginning and peak of season. This will provide an opportunity to validate the method and calibrate the threshold levels according to different test locations / subspecies. The initial threshold level for chemical treatment against Varroa will be 10% infestation of adult bees. The investigation of Nosema infestation was discussed together with the question of threshold levels. The decision was not to remove colonies with high Nosema infestations, but to collect relevant data that may permit establishment of thresholds in the future. It was suggested to consult with WG2 on Nosema sampling and infection across colonies. Analysis of virus infestations was also discussed, but no decisions were made yet, because only few labs, if any, would be able (technically and financially) to perform these analyses.

The question of genetic analysis of the strains used in the experiment was briefly discussed but dismissed, since this would entail agreement on a standard measurement of genetic origin. Each participating group should be responsible of certifying the declared origin, and samples of workers from all colonies during the experiment should be collected for a possible future genetic analysis. In each location, one of the test strains should belong to the autochthonous subspecies of the area. In some cases, such as Germany or Denmark, this can be replaced by the race traditionally kept in the last 50 years.

Ralph Büchler is coordinating this experiment. The deadline to communicate your interest of participation to Ralph is the **15th of April**. The testing capacity (number of colonies, number and kind of races) should be specified, so that by the end of April the experimental plan can be finished.

A workshop will be conducted in Kirchhain in the summer of 2009 to standardize the evaluation methods among participants. The duration will be 3 or 4 days and dates will be either week 31 (July 27-Aug2) or in week 33 (Aug 10-14). Further details will be given as soon as available. Ralph Büchler will be responsible for registering the workshop with Peter Neumann in time (deadline April 1). Your interest in this workshop should be communicated to Ralph by April 15.

A workshop in the island of Unije has been initiated for the current funding period which ends on May 29. Nikola Kezic is responsible for the planning of this workshop. Further details will be distributed as soon as available.

The issue of legal, technical and economical aspects of transporting queens from one country to another was raised. Authorization from veterinary authorities is needed (TRACES certificate: a health certificate required for each shipment of queens, costing roughly 100 euros). Per Kryger offered to look into this point and distribute relevant information among WG4, but every individual participant will be responsible to meet the regulations in place in their country. A possibility for exchange of queens may be the summer workshop, and a late chance may be represented by the autumn Coloss meeting just before Apimondia.

The use of a website platform for exchange of information was suggested, which will hopefully be possible as soon as the Coloss website is fully functional.

4) “Working group mix”

Members of other WGs attended this session. Several issues were discussed, such as the investigation of local variability, the influence of environmental factors on queen quality, and the possible effect of pesticides on drones. The question of Nosema threshold levels was discussed with members of WG 2 (Pests and pathogens), but not resolved. WG2 will conduct a workshop on Varroa, considering the aspect of diversity of host response according to race, in which members of WG4 may be interested.

5) Review papers

We decided to contribute to the oncoming special issue of Journal of Apicultural Research on Colony Losses with a mini-review (about 4 printed pages) describing the aims and activities of WG 4. We agreed on the title “The role of genetic diversity and vitality on colony losses”. The deadline for submission is the 30th of April.

Maria Bouga and Cecilia Costa will collaborate to write the part related to genetic diversity. Fani Hatjina will be responsible for aspects of vitality. Per Kryger will contribute the role of losses on depletion of genetic stock. Ralph Büchler and Marina Meixner will work on a general introduction. Following a suggestion from Per, “Google documents” should be tried for group writing. Marina will coordinate and edit the review paper. A first draft should be sent to her as early as possible. The "final" version of each contribution must be sent to her no later than April 20th. Normal rules of authorship apply.

We also discussed contributions to the review papers ongoing in WG 4:

- “Methods to assess queen quality” started by Fani Hatjina, for which it was decided that measurements at colony level should not be included in this review;
- “Methods for discrimination of European honey bee populations” started by Maria Bouga, which aims at describing what methodology is being applied at the moment and some descriptive data. The deadline for contributions to this paper is the 1st of April.

DEADLINE OVERVIEW - (WG 4 relevant deadlines ONLY)

<u>1st April:</u>	contributions to Maria’s review workshop application to Peter Neumann
<u>15th April:</u>	communication to Ralph on participation to GEI experiment and relevant details
.....	decision on workshop date
.....	registration for participation in workshop
<u>20th April:</u>	final version of each mini review contribution to Marina
<u>30th April:</u>	deadline for submission of mini review