

An update on progress of a wing morphometry study of honey bee race in Scotland

Alison Gray, Department of Mathematics and Statistics, University of Strathclyde

Many readers will have received an email invitation in July to take part in a new project to study the race of managed honey bees in Scotland. An initial enquiry was sent to SBA members open to participation in surveys, via an online questionnaire programme which we have used in the last few years for the SBA/COLOSS survey. There were just a few short questions this time, allowing for expression of interest in sampling bees for this new study and return of contact details and the postcode of the apiary likely to be used for sampling. About 1200 members were contacted, and 150 positive responses were received.

With the help of Dr Mary Frances Coffey of the University of Limerick, who has been carrying out a similar study over a longer time period in Ireland, I and Magnus Peterson devised a protocol for participants to use for taking a sample of their bees. The sampling was planned for 11th to 13th August, over a weekend, with return of frozen bee samples to me by first class post early the next week.

We worked one very long day assembling sampling packs, and sent them in two batches to those who had expressed interest in participating, one batch to catch the late afternoon post and the rest the following morning. To minimise postage costs but still allow pre-paid return postage, we had sourced an unusual shallow container for bees, but this worked well!

As we tried to keep effort for the beekeeper minimal and cost-free, at the start of the study we felt that there could possibly be a large number of people indicating interest. In that event we would have drawn a random sample of beekeepers from that group, by area, to cover the country as well as possible. It did not quite work out like that, and so we included everyone who offered to take part. A few other participants came forward later and we ended up with 167 in total saying they could send a sample of bees. The total number of beekeepers actually sending bees was 133, representing 135 locations.

We'd like to thank very much all the beekeepers who took time to sample their bees, especially as some people were clearly not comfortable freezing any of their bees, and also those who took extra care to ensure the safe arrival of their bees: two of the samples were even delivered in person! In fact some sampling and posting was delayed for various reasons, and the last sample was received in early October. Unfortunately one or two samples were stuck in the post for longer than planned.

The map included here shows the responses received according to postcode of the apiaries sampled. The vision for the project was to map honey bee race across the whole of Scotland. We will not quite manage that, as some areas of the country are clearly not well represented among the respondents, but the central belt is certainly very well covered and we should obtain a good picture of bee race there, as well as an idea of what is present in the Borders, the North East, Inverness and Morayshire and also some of the islands.

Owing to other work demands, the samples are still frozen and we are at present sourcing materials for slide mounting of the samples. Carrying out the slide preparation for all the samples is likely to take a few weeks. This should be completed in early February. After that we will image the slides, a much faster task, then begin the wing morphometry. We intend to send preliminary results for their own bees back to individual beekeepers in batches, for faster feedback. It should be possible to start return of results by late February/early March. The next step will be to do more advanced statistical

work to examine the results across the country, using several different approaches. Another aspect of the study is DNA analysis, for definitive results and also for results to compare to those from the wing morphometry. Dr Mark Barnett of the Roslin Institute has kindly offered his advice and help in taking that forward, and we hope to be able to report progress later in 2018.

There is considerable interest in the native honey bee, as evidenced by the recent formation of the Scottish Native Honey Bee Society (SNHBS), to work to mitigate the effects of honey bee importation and hybridisation. Whilst our study has not especially sought out colonies of *Apis mellifera mellifera*, we are very interested to find out whether it might uncover some pockets of colonies close to *A.m.m.* It should certainly provide some information not presently available about distribution of honey bee sub-species in Scotland.

