

## EXECUTIVE SUMMARY

### Preliminary examination of Native Irish Honey Bee (*Apis mellifera mellifera*) using Mitochondrial DNA analysis, for the establishment of conservation areas for the protection of the species

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*Apis mellifera mellifera* (Amm), the European Dark Honey Bee, had an original habitat that stretched from Ireland to central Europe but due to a variety of reasons such as importation of other breeds, cross breeding and disease, their numbers have dropped significantly. It is thought that Ireland may be one of the last bastions of pure Amm in Europe.

This project used modern molecular analysis methods to determine the genetic state of sampled Irish Honeybee populations with regards to subspecies present and the level of introgression and hybridisation within said populations.

Throughout the course of this project, 275 hives from 26 bee breeders from across the country were sampled. From these hives, 180 microsatellite and 82 mitochondrial sequences have been generated and all are either completely analysed or else in the advanced stages of analysis.

From the analysed samples, all were determined to be greater than 95% pure Amm by means of microsatellite analysis. The mitochondrial analysis of the same samples showed that more than 90% of the samples were of the M lineage and that while the remaining samples were of the C lineage, subsequent breeding over generations with native Amm has resulted in these samples being greater than 95% Amm. This would indicate that although some historic C lineage introgression occurred in these samples, the dominance of the local Amm population resulted in subsequent generations reverting to a high percentage Amm.

The results of this project show that there exists pure native stocks of *Apis mellifera mellifera* in Ireland. Future work, in conjunction with NUI Galway, aims to expand upon the regions examined to provide a comprehensive genetic population map of the country.

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