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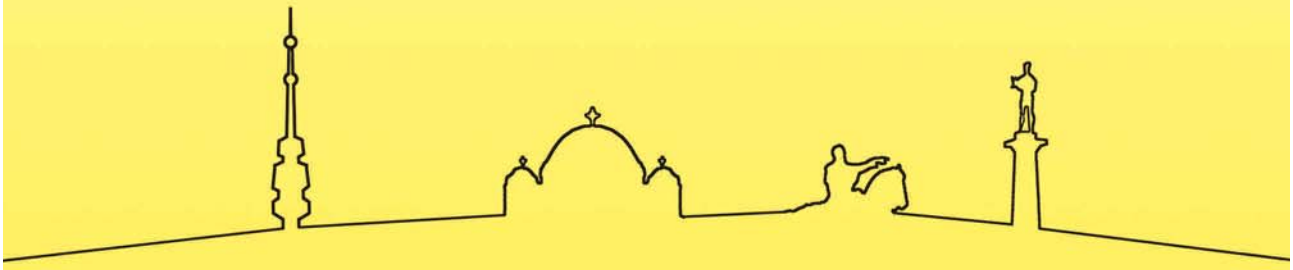

CONSERVATION STATUS OF THE ENDEMIC EUROPEAN DARK HONEY BEE (*APIS MELLIFERA MELLIFERA*) IN BELGIUM & THE NETHERLANDS

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Due to past and present imports of *Apis mellifera ligustica* (Italian bees), *Apis mellifera carnica* (Carniolan bees) and the Buckfast bee (a hybrid strain) across its entire natural range, the European Dark Honey bee (*Apis mellifera mellifera*) is currently threatened with extinction by genetic pollution through hybridization. In the past, genomic research has shown the European Dark Honey bee was still present in the Belgian Chimay area and on the Dutch North Sea Isle of Texel. However, as the risk of beekeepers importing non-native honey bees into the area remains, which could rapidly threaten the genetic integrity of the endemic honey bee population, monitoring hybridization is a key element in conservation and breeding. Within the framework of the Flemish Beekeeping Programme, 246 honey bee colonies originating from the Belgian population of Chimay (108) and the Dutch North Sea island populations of Texel (6) and Terschelling (132) were sampled in autumn 2021 to identify pure European Dark Honey bee colonies with which to support the Flemish *A. m. mellifera* breeding activities. The population of Terschelling, which has not been studied before, was included because local beekeepers claimed their colonies looked and behaved like European Dark Honey bees. Of each sampled honey bee colony 10 worker bees were used for this study, including measuring wing morphometrics (based on cubital index, discoidal shift angle and hantal index) and estimating the extent of C-lineage introgression in the ncDNA by applying a custom-tailored SNP genotype assay. Q-values for most sampled honey bee colonies were above 90% for M-lineage: 85 out of 108 colonies for Chimay; 106 out of 132 colonies for Terschelling and all 6 colonies for Texel. Both the populations of Chimay and Texel seem to be spared from intense hybridization over the past decades, whilst a novel remnant population of the European Dark Honey bee was found on the Isle of Terschelling. The correlation between wing morphometrics and molecular data was significant but very weak (Spearman r = 0.20, p = 0.002), indicating the SNP genotype assay is a more valuable tool for assisting in breeding and conservation activities.

Keywords: *Apis mellifera mellifera*, Wing Morphometrics, SNP, honey bee conservation