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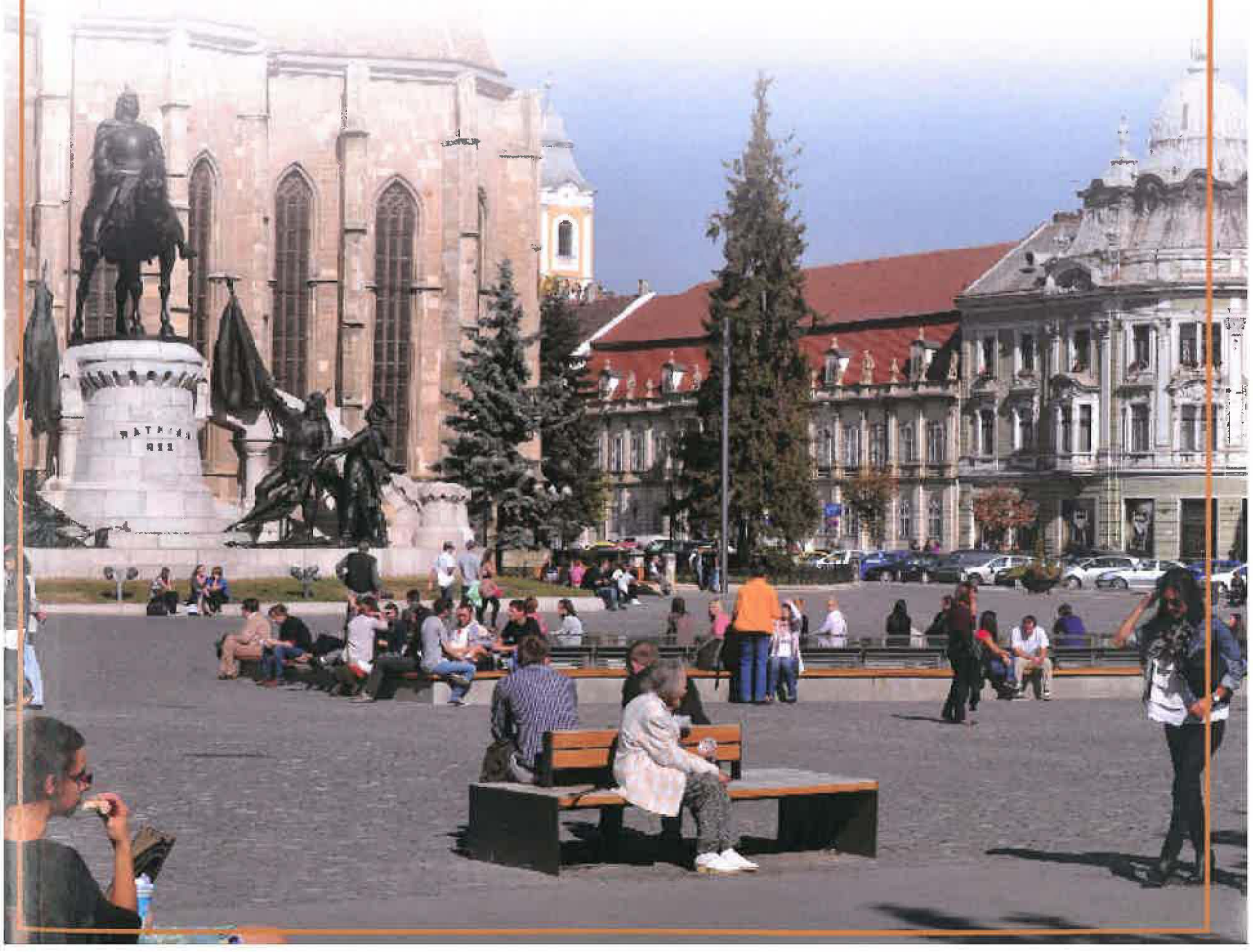

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Geometric morphometrics of wings of drones and workers supporta process of secondary contact inthe Iberian honey bee (*Apis mellifera iberiensis*)

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A recent survey of the Iberian honeybee genetic patterns usingconcurrently mtDNA and nuclear (SNPs) markers revealed the presence of a concordant southwestern-northeastern cline in Iberia,supportinga post-glacial secondary contact process. Here, we followed up those findings with geometric morphometrics of wings. The aim was two-fold:(1) evaluating the effectiveness of this approachin capturing the clinal pattern and (2) comparing the effectiveness of drones and workers in detecting the clinal pattern. To that end, we useda fine-scale sampleof 711 colonies taken across three Iberian north-south transects. For each colony, we recorded the geographical coordinates and collected the right forewing of fiveworkers and fivedrones. We plotted19 landmarks in the forewing venation of over 7100 individuals, and after the Procrustes alignment, the distances between landmarks were calculated. The distance matrix was used to infer population structure by applying a spatial multivariate analysis based on principal component analysis and Moran's autocorrelation. A correlation analysis was performed between the first spatial component of drones and workers witha SNP dataset. Interestingly, the spatial patterns inferred from the wings of both workers and drones, which were greatlyconcordant, displayed the presence of two clusterswith a spatial distribution overlapping with mtDNA and SNP data. Our findings suggest that geometric morphometrics is able to detect the signature of complex evolutionary processes. CN is funded through the 2013-2014 BiodivERsA/FACCE-JPI Joint call for research proposals, with the national funders FCT (Portugal), "CNRS" (France), and"MEC" (Spain).