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Vespa velutina nigrithorax intracolonial microsatellite diversity: comparison between nests of the founder and leading edge populations in Portugal

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Abstract:
The invasive yellow-legged hornet, *Vespa velutina nigrithorax,* is a voracious predator of honeybees which has been causing important economic losses to apiculture across Europe. It was first seen in 2004 in France, and it rapidly spread throughout the European countries. In 2011, *V. v. nigrithorax* was first reported in Portugal, in the region of Viana do Castelo, and since then it has been spreading throughout the country, with Bragança representing the edge of its distributional range in northeastern Portugal. The aim of this study was to compare the intra-colony genetic diversity of nests collected Viana do Castelo and Bragança. A total of 120 workers (sterile females) were sampled from two nests from Viana do Castelo and two from Bragança (30 worker per nest). Total DNA was extracted from the thorax of each individual using the Nucleospin® Tissue (Macherey-Nagel). The individuals were genotyped using 16 microsatellite loci divided into three multiplex combinations. The lengths of the fragments were determined using GeneMapper 3.7 (Applied Biosystems). Genetic diversity statistics, which included observed number of alleles (Na), effective number of alleles (Ne), observed heterozygosity (Ho), expected heterozygosity (He), and unbiased expected heterozygosity (uHe) were estimated using GENALEX 6.5. This software was also implemented to assess genetic structure using a Principal Coordinate Analyses (PCoA). Our results show that both nests from both origins have low genetic diversity, with Bragança showing higher genetic diversity (Na=2; Ne= 1.600; Ho=0.427; He=0.330; uHe=0.333) than Viana do Castelo (Na=1.750; Ne=1.482; Ho=0.363; He=0.258; uHe=0.260). The genetic structure analysis shows that the two nest origins form two distinct groups. These results suggest that yellow-legged hornet population from the region of Bragança may be an expansion from multiple source populations.

Keywords: yellow-legged hornet, population genetics, molecular markers, invasive species

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Poster Presentation