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► To cite this version:

Antoine Mignotte, Karine Huber, Laetitia Gardes, Thomas Balenghien, Maxime Duhayon, et al.. Landscape genetics of *Culicoides* (Diptera: Ceratopogonidae) vector species: evaluation of cryptic diversity and gene flow in the Palearctic region. 21st conference of the European Society for Vector Ecology (E-SOVE), Oct 2018, Palerme, Italy. , 2018. hal-02787712

HAL Id: hal-02787712

<https://hal.inrae.fr/hal-02787712v1>

Submitted on 5 Jun 2020

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Landscape genetics of *Culicoides* (Diptera: Ceratopogonidae) vector species : evaluation of cryptic diversity and gene flow in the Palearctic region

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Landscape genetics is an approach for understanding how geographical and environmental features structure genetic variation. Whether landscape patterns, in particular those created by human land uses, influence gene flow and its intensity to understand the spread of vector-borne diseases. *Culicoides* dispersal capacities are described as 'dispersive stratified' which results from the combination of processes occurring at a short distance combined with jumps over long distances. Although winds and local air movements have an undeniable role in the dispersal of *Culicoides*, anthropogenic factors also play a predominant role, particularly at the local level (host distribution, landscape patterns). Our overall objective is to characterize the dispersal abilities of two main vector species in Europe, *C. obsoletus* and *C. chiopterus*, showing different host-vector behaviors.

However, *Culicoides obsoletus* is reported in sympatry with one morphologically indistinguishable species, *C. scoticus*, and other morphologically related species, *C. chiopterus*, *C. dewulfi* and *C. montanus*. Moreover, recently, several authors have reported the existence of cryptic diversity within the species commonly called *C. obsoletus*. Sequencing a portion of the Cox1 mitochondrial gene of 3,200 *C. obsoletus/C. scoticus* individuals from 17 European countries revealed two clades within *C. scoticus* and confirmed the presence of at least three undescribed phylogenetic clades (*C. obsoletus* clade O2, *C. obsoletus* clade "Dark" and one not yet named) close to *C. obsoletus*. These results are reinforced by rDNA16S mitochondrial gene sequences and a gene coding for ribosomal rDNA18S, over the entire haplotypic diversity resulting from Cox1 barcoding.

Then, we investigated how dispersion shapes the spatial arrangement of *C. obsoletus* genetic diversity in Europe using 13 microsatellite markers by observing patterns of allelic frequency distributions. This work is the first step to a more comprehensive study on the landscape genetics of two main vector species in the Palearctic region, *C. obsoletus* and *C. chiopterus*.