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## I-8. ECOLOGICAL NICHE MODELING AND VECTOR-DIROFILARIA SHARING AS TOOLS TO ASSESS THE RISK OF DIROFILARIA INFECTION.

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In Europe, *Dirofilaria* infection is of significant veterinary and economic importance due to its impact on the health and welfare of both domestic and wild animals, primarily canids and felids. The presence of *Dirofilaria immitis* and *D. repens* is influenced by bioclimatic and environmental factors that determine the survival of its vectors—culicid mosquitoes. To analyse the risk of infection of vector-borne parasitic diseases as a control measure, ecological niche models, which take into account the behaviour of parasites in vectors, are good tools for this purpose, and colour maps can be made to report the areas at risk of infection with a precision of 1 km$^2$. We used ArcMap 10.8 to process both bioclimatic variables (related to temperature and precipitation) and environmental variables (such as water bodies, human footprint, and herbaceous and shrub density). After identifying the key predictor variables, we developed ecological niche models for *Culex pipiens* and *Aedes albopictus* using the MaxEnt algorithm, automated via the Kuenm R package. Additionally, we calculated the number of *Dirofilaria* spp. generations both annually and on a monthly basis as a function of temperature, using a custom R script. In most parts of the continent, the risk of infection is minimal during the winter months, except in some Mediterranean coastal regions, where some residual risk persists. In contrast, spring and summer bring an increased risk of infection in a significant part of the European continent, with the exception of the higher latitude areas together with the United Kingdom, the Scandinavian Peninsula (Norway, Sweden and Finland) and Russia, as well as high mountainous areas. Southern Europe, characterised by its warmer climate, experiences a high risk of infection, while in central Europe the risk becomes moderate to high. More risk assessments using the same methodology have also been carried out in Spain, and Portugal, Greece, Italy and Serbia with very interesting results. The forecasts do not bode well and a significant expansion of the risk of infection towards the north-eastern regions of the continent is foreseen. The creation of this type of maps where the risk of infection is analysed is a good control tool that should be taken into account by veterinary and public health staff, from their One Health point of view.

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