



Modelling the temporal dynamics of *Culicoides* populations on Reunion Island (Indian Ocean) vectors of viruses of veterinary importance

Yannick Grimaud, Hélène Guis, Annelise Tran, Frédéric Chiroleu, Olivier Esnault, Eric Cardinale, Claire Garros

► To cite this version:

Yannick Grimaud, Hélène Guis, Annelise Tran, Frédéric Chiroleu, Olivier Esnault, et al.. Modelling the temporal dynamics of *Culicoides* populations on Reunion Island (Indian Ocean) vectors of viruses of veterinary importance. 7. International SOVE Congress, Oct 2017, Palma of Mallorca, Balearic Islands, Spain. , 2017. hal-02789059

HAL Id: hal-02789059

<https://hal.inrae.fr/hal-02789059>

Submitted on 5 Jun 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Modelling the temporal dynamics of *Culicoides* populations on Reunion Island (Indian Ocean) vectors of viruses of veterinary importance

Yannick Grimaud^{1,2}, Hélène Guis^{3,4}, Annelise Tran^{2,3,5}, Olivier Esnault¹, Eric Cardinale^{2,3}, Claire Garros^{2,3} Groupement de Défense Sanitaire, La Plaine des Cafres, La Réunion, France¹; UMR ASTRE, CIRAD-INRA, F-97491 Saint Clotilde, La Réunion, France²; UMR ASTRE, CIRAD-INRA, F-34398 Montpellier, France³; Institut Pasteur de Madagascar, Antananarivo, Madagascar⁴, UMR TETIS, CIRAD, F-34398 Montpellier, France⁵.
yannick.grimaud@gds974.re

Reunion Island regularly faces outbreaks of epizootic haemorrhagic disease (EHD) and bluetongue (BT), two viral diseases transmitted by haematophagous midges of the genus *Culicoides* (Diptera: Ceratopogonidae). To date, only 5 species of *Culicoides* are recorded in Reunion Island: *Culicoides imicola*, *C. bolitinos*, *C. enderleini*, *C. grahamii*, and *C. kibatiensis*. Among these, at least the first three have been implicated in the transmission of BT and EHD viruses to ruminants. Since January 2016, biweekly monitoring using OVI traps have been set up in 10 sites to study the temporal dynamics of each species. A hurdle model (i.e. a logistic regression presence/ absence model combined with a zero-truncated negative binomial mixed effect abundance model) was developed for each species in order to obtain first insights regarding the climatic and environmental determinants driving presence/absence and abundance of *Culicoides*. Our first results show that temperature, wind speed, vegetation index and rain are main parameters affecting *Culicoides* abundance. This study is the first step to model *Culicoides* population dynamics in Reunion Island. In the absence of vaccination and vector control strategies, this could help farmers, stakeholders and veterinary services identify the high abundance period and potentially high risk periods for both viruses.