* **Thesis title**: Bio-ecological studies and integrative taxonomy of *Culicoides* (Diptera: Ceratopogonidae) in the Afrotropical region

* **Field of Specialisation**: Molecular ecology, Vector-borne diseases, and Genomics

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Summary:

In a context of emergence or re-emergence of vector-borne diseases, certain species of *Culicoides* (Diptera: Ceratopogonidae) are involved in the transmission of certain viruses (Reoviridae: *Orbivirus*) and nematodes (Onchocercidae: *Mansonella*) in the Afrotropical region. Although of main economic importance, the actual taxonomic and ecological knowledge limit the understanding of the disease epidemiology and thus the implementation of appropriate and effective vector control strategies. The systematic and taxonomic schemes are problematic as different authors disagree on the placement of species into specific subgenera or groups. Furthermore, the bio-ecology of species of veterinary interest remains to be explored.

Here, we conducted an integrative taxonomy (morphological identification and molecular approach) work to revise systematic and taxonomic of species belonging to subgenera and groups of veterinary interest using a multi-marker molecular phylogeny and species delineation. Our results show (i) the presence of monophyletic clades; (ii) a new species for science named *C. sp*. # 22 and affiliated into the subgenus *Avaritia*, (iii) affiliating the Similis and Neavei species groups to the subgenus *Synhelea*, and (iv) cryptic species within *C. oxystoma* (subgenus *Remmia*).

Secondly, we established reference DNA barcode for Afrotropical *Culicoides* for species identification on a large number of samples of *Culicoides* larvae from the Niayes area of Senegal, West Africa. This study proves the efficiency of DNA barcoding for studying *Culicoides* larval diversity from field samples.

Using innovative ecological approaches, we described the trophic behaviour of *C. imicola*, *C. kingi* and *C. oxystoma* as well as their larval habitats in equine environments of the Niayes area in Senegal. This work completes the corpus of knowledge about the genus *Culicoides* in the Afrotropical region to improve our knowledge on the epidemiology of the transmitted pathogens and to propose research tracks to better control the immature and adult populations of the vector species in order to better anticipate and prevent *Culicoides*-borne diseases outbreaks.

Key words: Systematics, taxonomy, bio-ecology *Culicoides*, Senegal, Afrotropical region