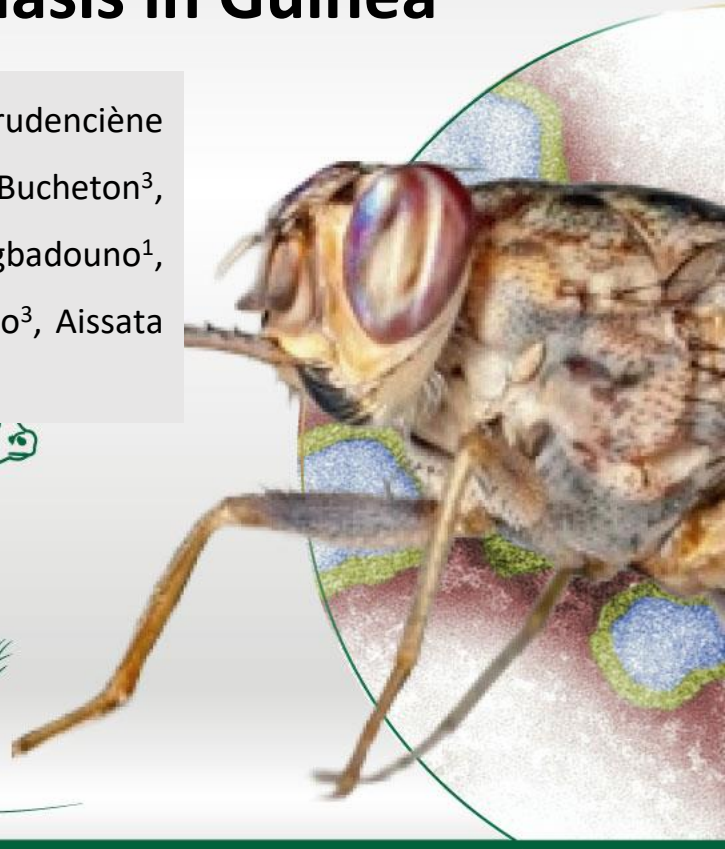
37TH CONFERENCE OF THE INTERNATIONAL SCIENTIFIC COUNCIL FOR TRYPANOSOMIASIS RESEARCH AND CONTROL (ISCTRC)
15 – 19 September, 2025 Nairobi, Kenya

37E CONFÉRENCE DU CONSEIL SCIENTIFIQUE INTERNATIONAL POUR LA RECHERCHE ET LE CONTROLE SUR LA TRYPANOSOMIASE (CSIRCT)
15 – 19 septembre 2025, Nairobi, Kenya

A metabarcoding approach to examine the ecology of the tsetse fly in Forecariah, a focus of Human African Trypanosomiasis in Guinea

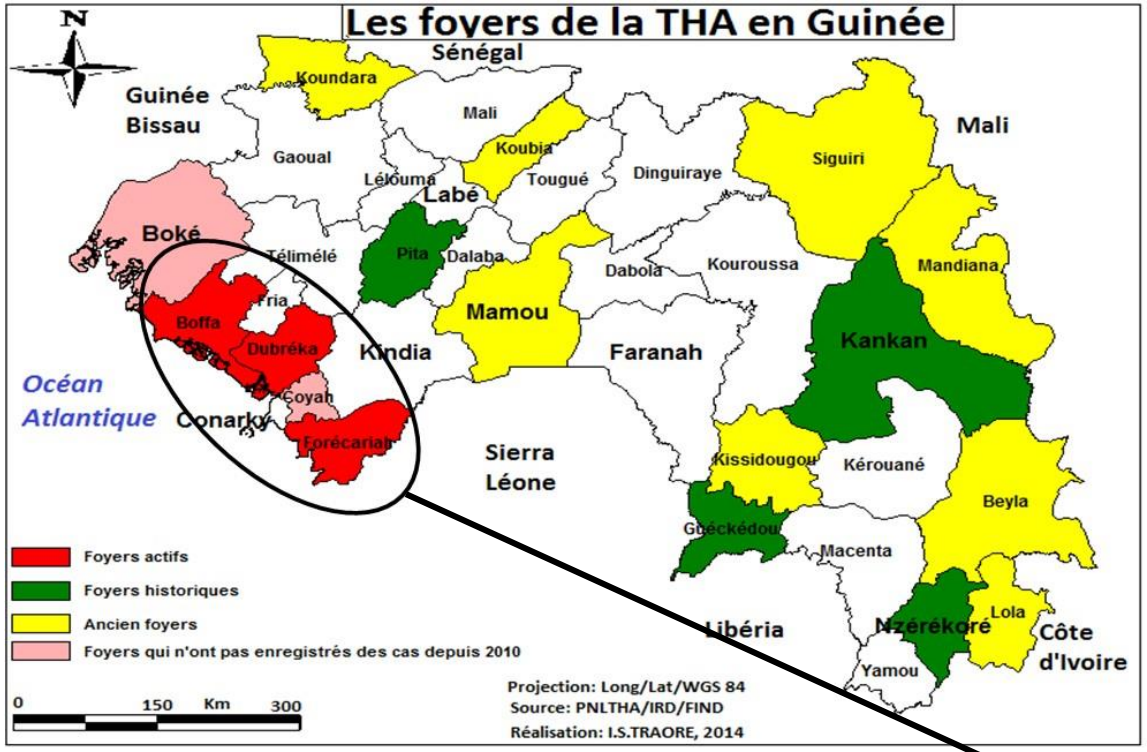
Abdoulaye Dansy Camara[1], Joel Israel Moo-Millan[2], Vincent Manzanilla[3], Allepo Innocent Abe[4], Prudenciène AGBOHO[5], Tiemélé Laurent-Simon AMOIKON[6], Anette Hernandez Andrade[2], Favié Béavogui[1], Bruno Bucheton[3], Oumou Camara[1], Anne Geiger[3], Isabelle Ellis[7], Jacques KABORE[4], Rolin Mitterrand KAMGA[8], Moise Kagbadouno[1], Moustapha Keita[1], Hugues Nana[9], Gabriella Sandrine Ondoua Nganjou[9], Gustave Simo[8], Philippe Solano[3], Aissata Soumah[1], Sophie Thévenon[3], Mamady Camara[1], Etienne Waleckx[2,3] & Jean-Mathieu Bart[1,3]*





INTRODUCTION

Foci of HAT in Guinea



Coastal zone characterised by the mangrove biotope



INTRODUCTION

❖ Efforts to control and eliminate the disease



Medical activities



Vector control



Elimination as a PSP validated in January 2025

INTRODUCTION



Mangrove



Rice growing



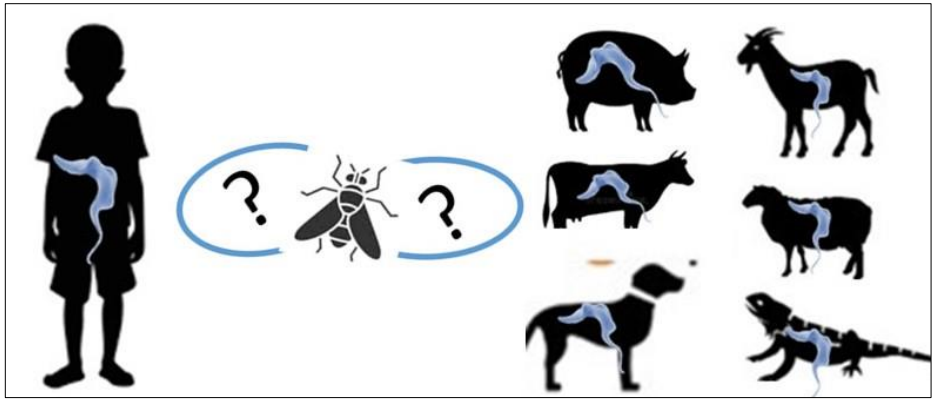
Mining



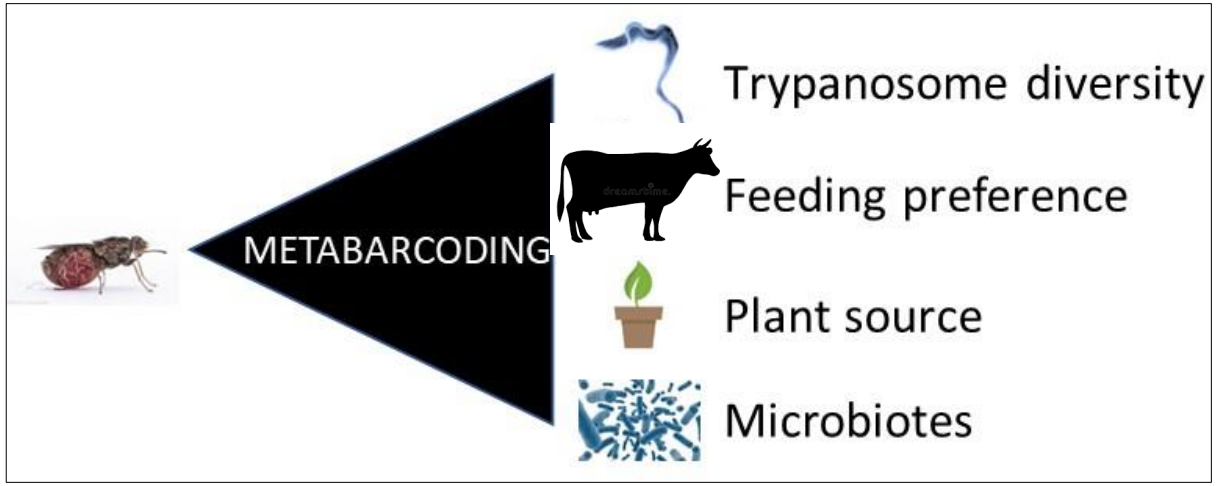
Interphase

Anthropisation

Transmission maintained by the presence of unknown reservoirs (dermal and animal) ?



MBC on tsetse fly, vectors of *Tbg*



INTRODUCTION

General objective

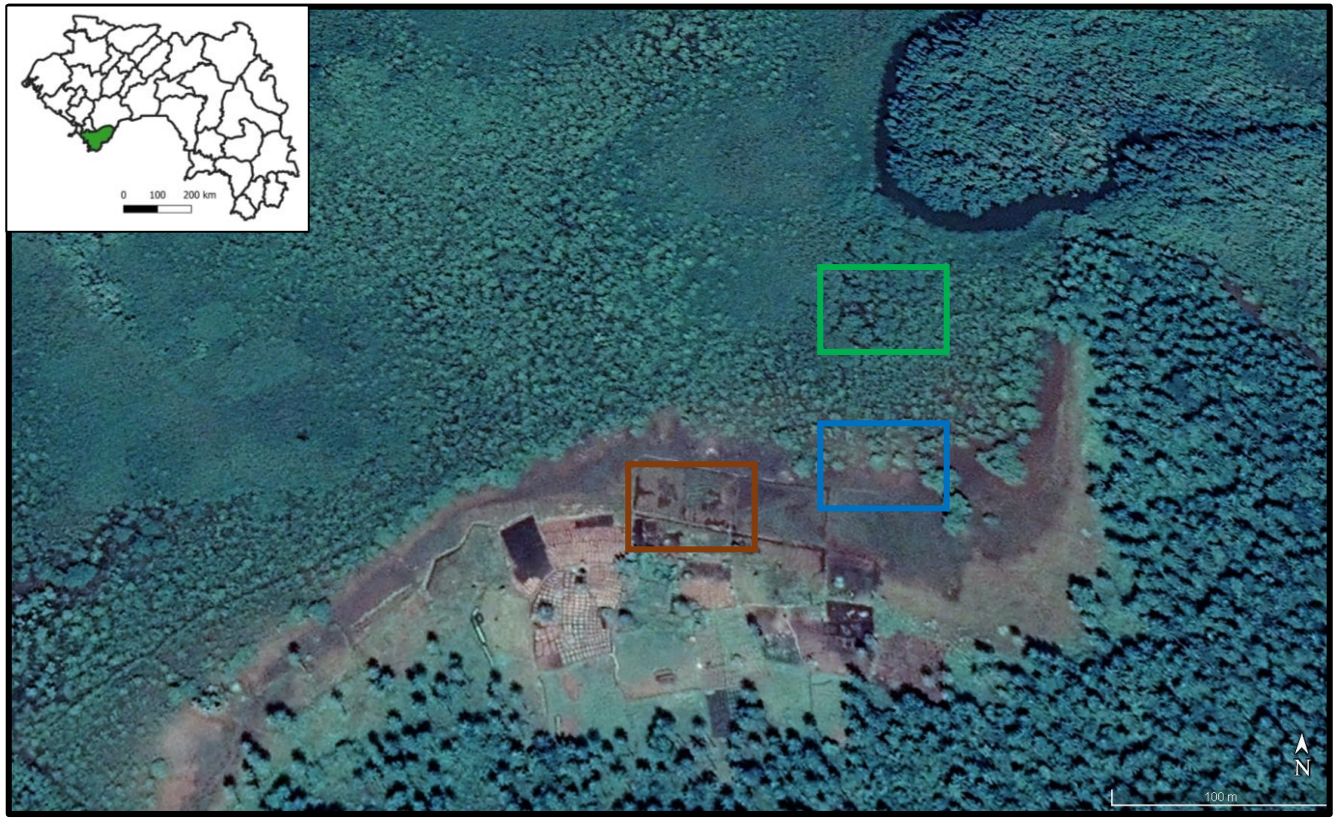
Using metabarcoding, to elucidate the transmission route of *Tbgambiense* in a complex eco-epidemiological context, with a view to adapt vector control strategies and reach sustainable elimination of transmission of HAT in Guinea.

Specific objectives

- To identify the trypanosomes circulating in tsetse flies
- To characterize the feeding behaviour of flies in different habitats;
- To study microbial communities and analyse interactions with plants.
- To reconstitute ecological association of the main parasite cycle actors.

METHODOLOGY

❖ **Entomological surveys (trapping and microscopic analysis) in the Forecariah HAT focus**





Mangrove



n=30



Interface



n=22



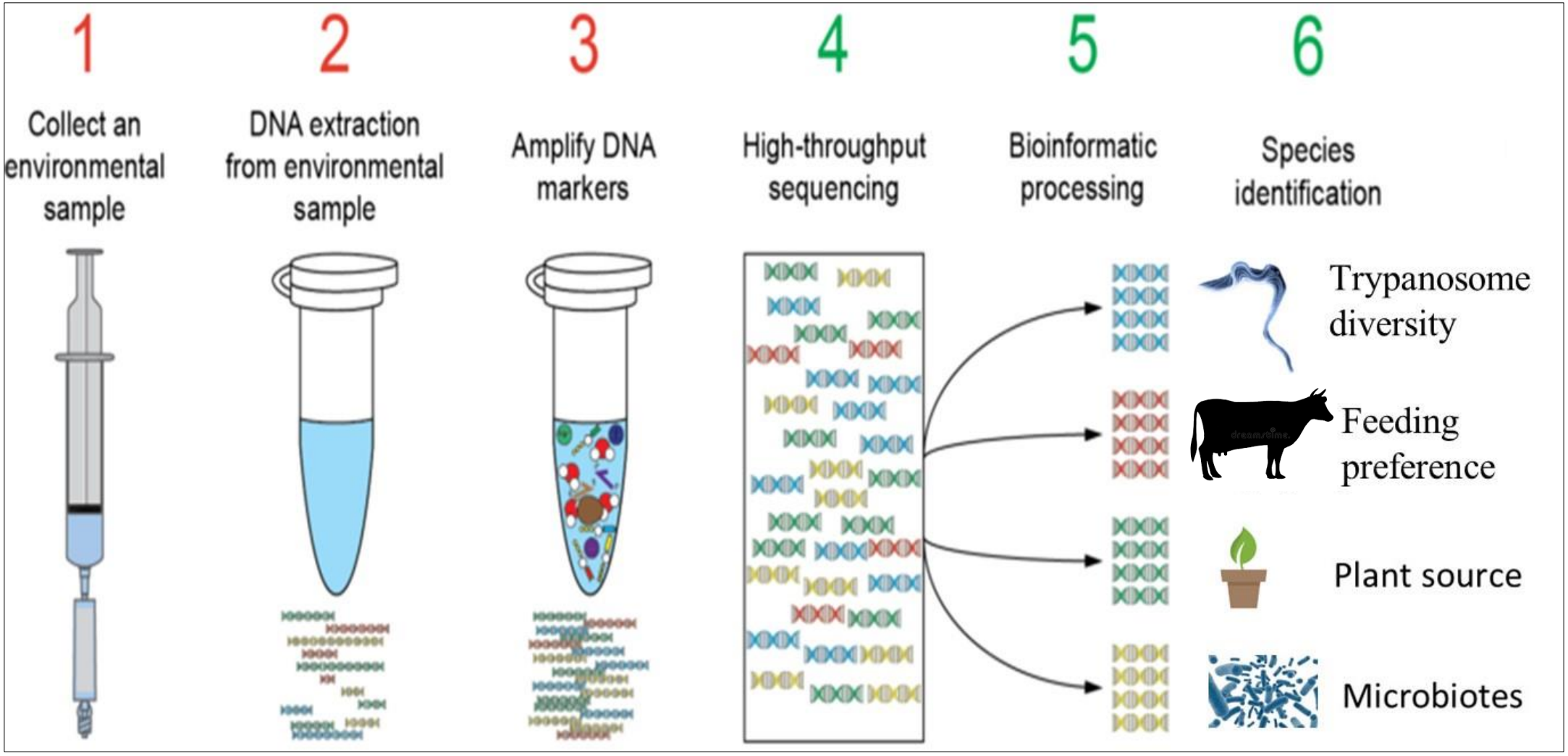
Farmland



n=21

METHODOLOGY

Metabarcoding principle



RESULTS

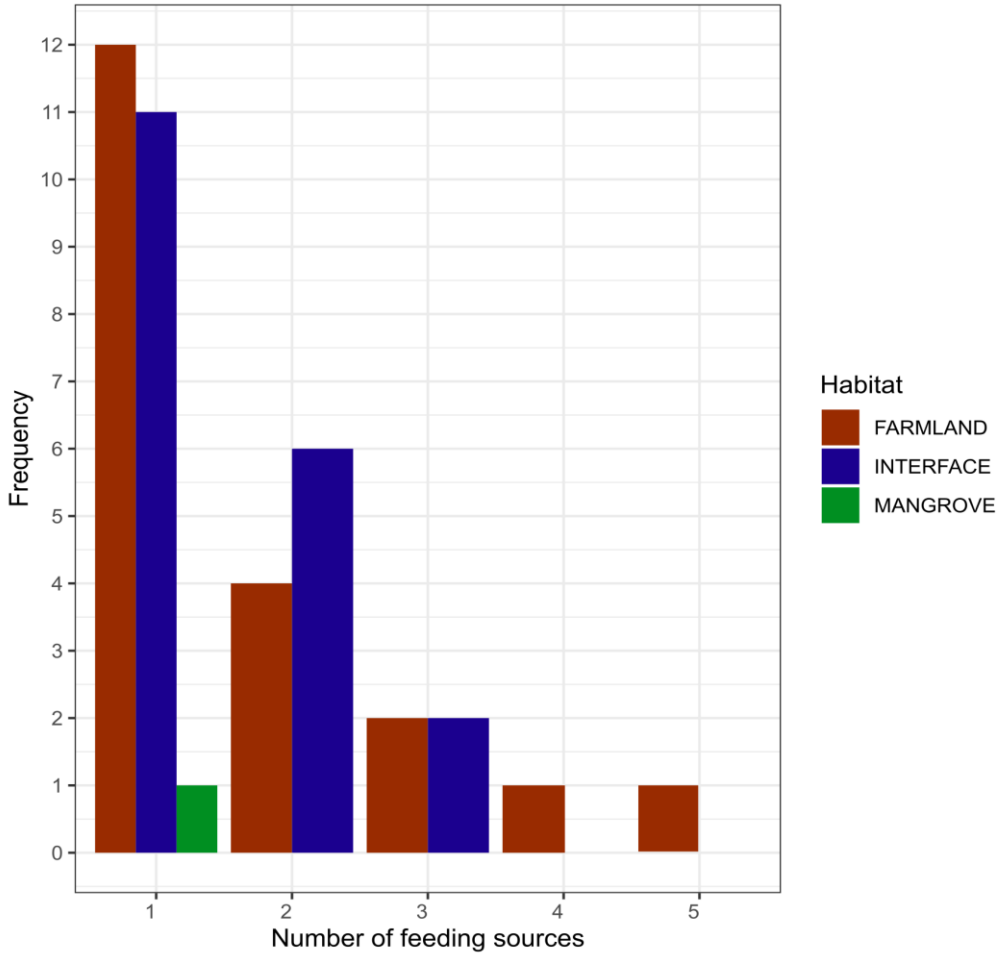


Identification des trypanosomes

	Habitat			18s Locus Analysis			
	Mangrove	Interface	Farmland	Species	Genebank#	Expect	Identities (%)
Number of flies caught	2	1	1	*T.grayi*	MK756193.1	8.00E-69	147/147 (100%)
	0	0	1	*T.vivax*	KM391821.1	3.00E-68	146/146 (100%)
	0	0	2	*Neobodo designis*	AY753605.1	2.00E-64	143/145 (99%)
	0	0	1	*Bodo saltans*	AY490227.1	4.00E-62	143/147 (97%)

RESULTS

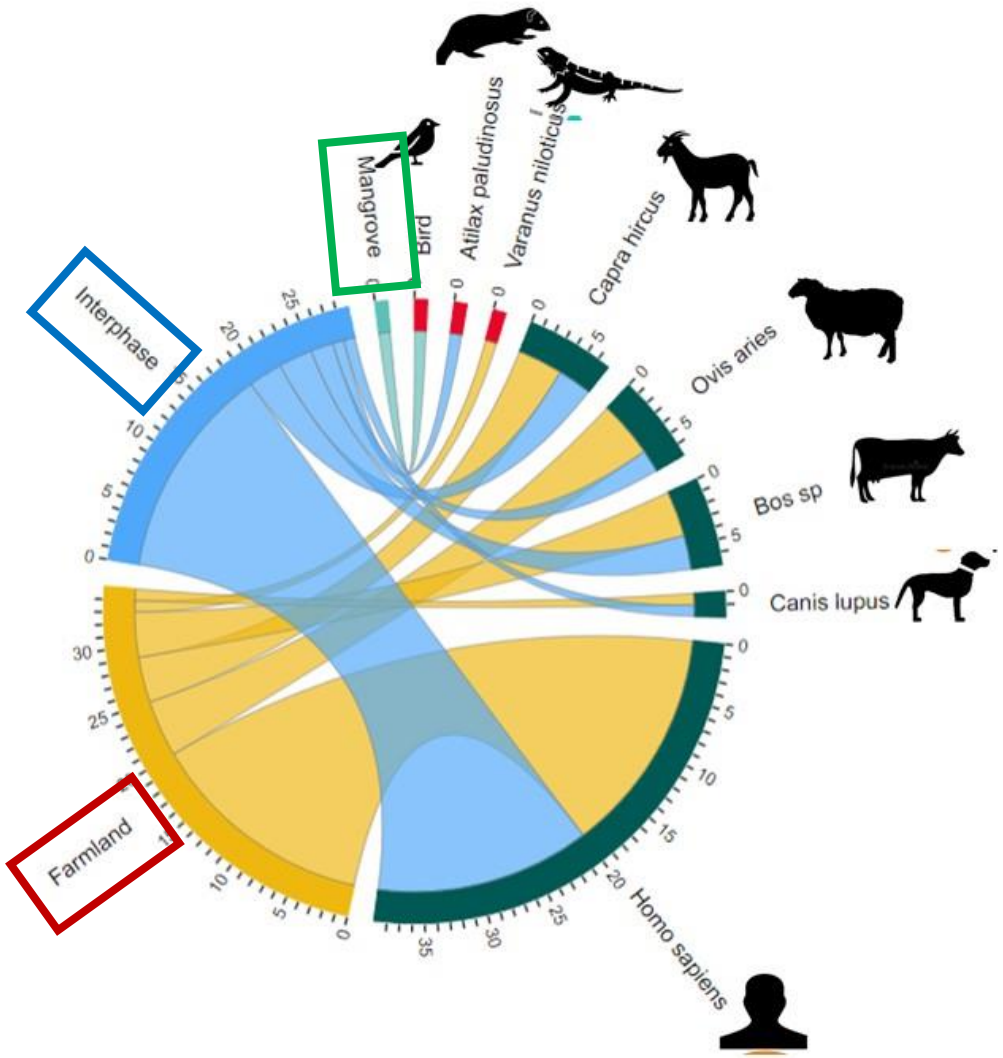
Feeding sources



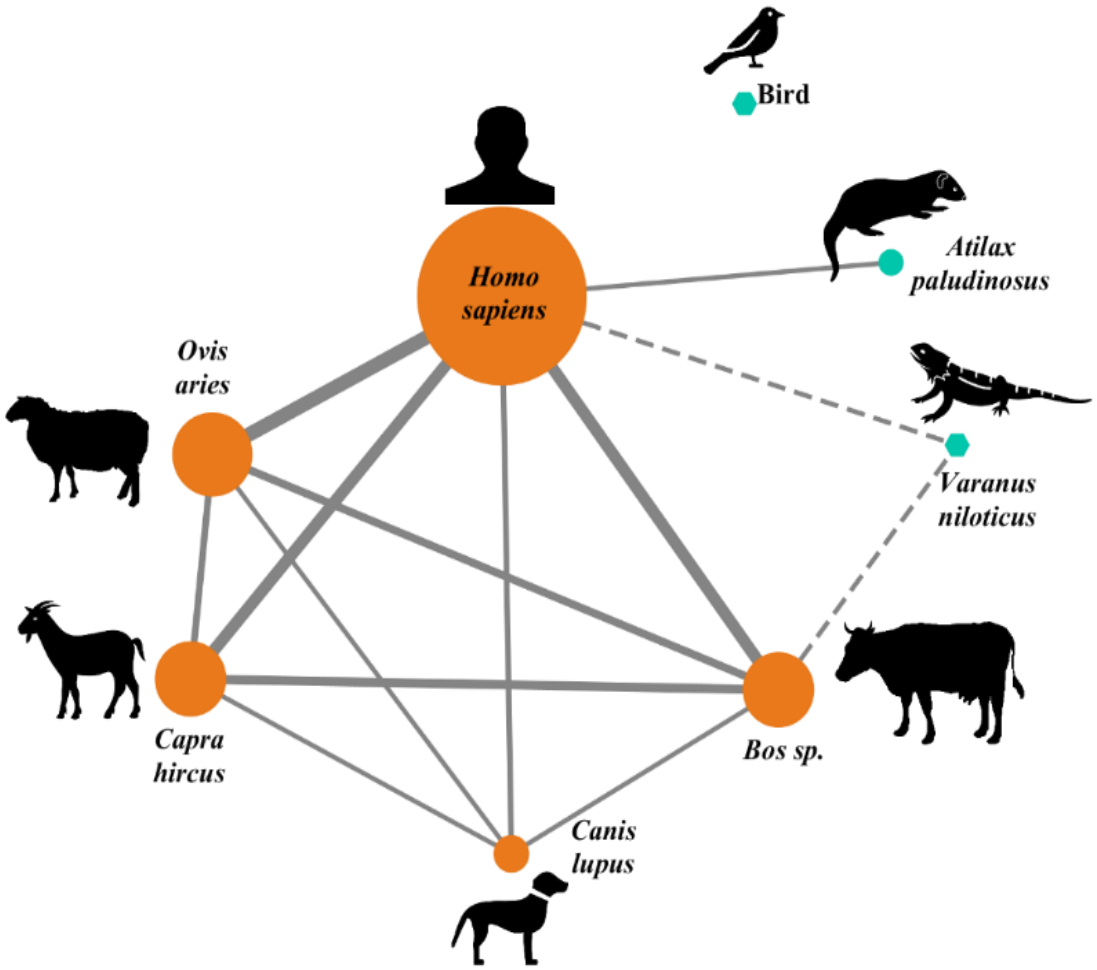
MBC approach allows to detect more than 1 feeding blood meal per fly

RESULTS

Feeding sources



Chord diagram representing the feeding sources of Tsetse flies according to the ecosystems (Mangrove, Interface and Farmland)

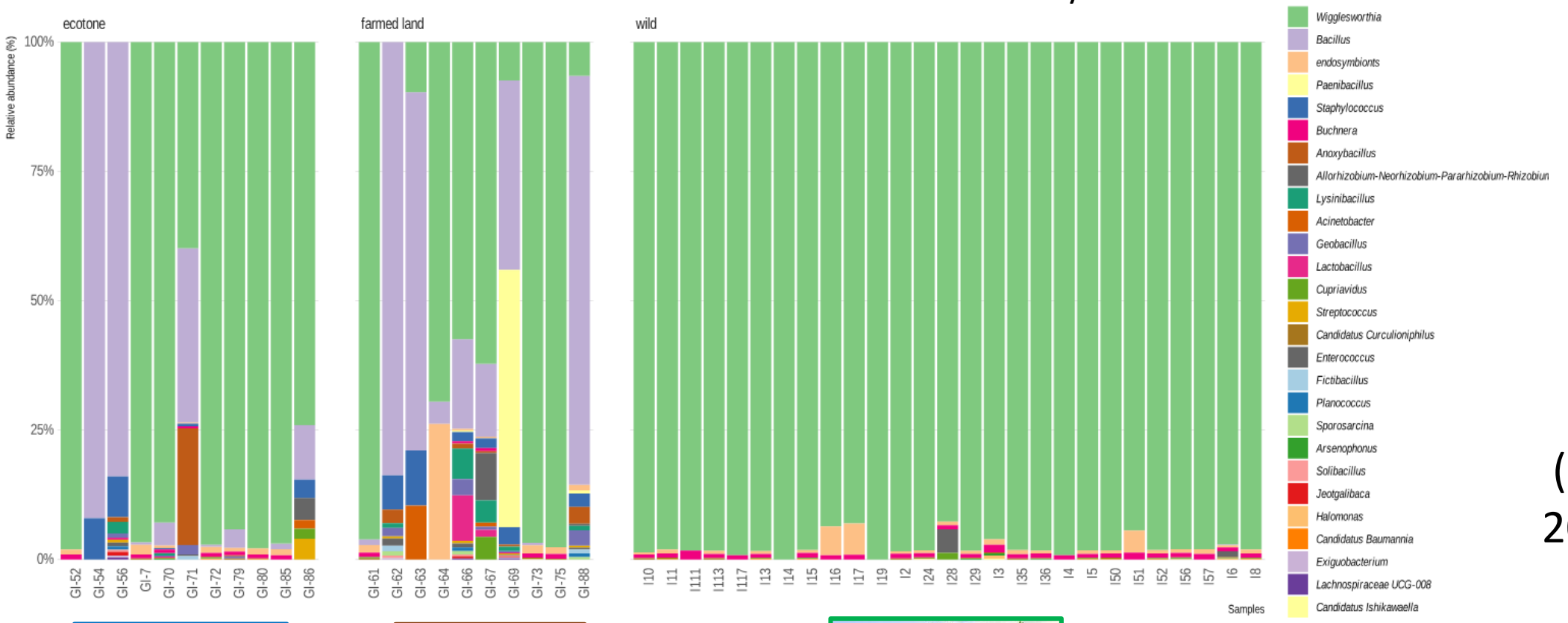


Network summarizing the relation between the feeding sources and the landscape.

RESULTS

Microbiote Composition

Relative abundance of bacterial flora and their distribution in ecosystems







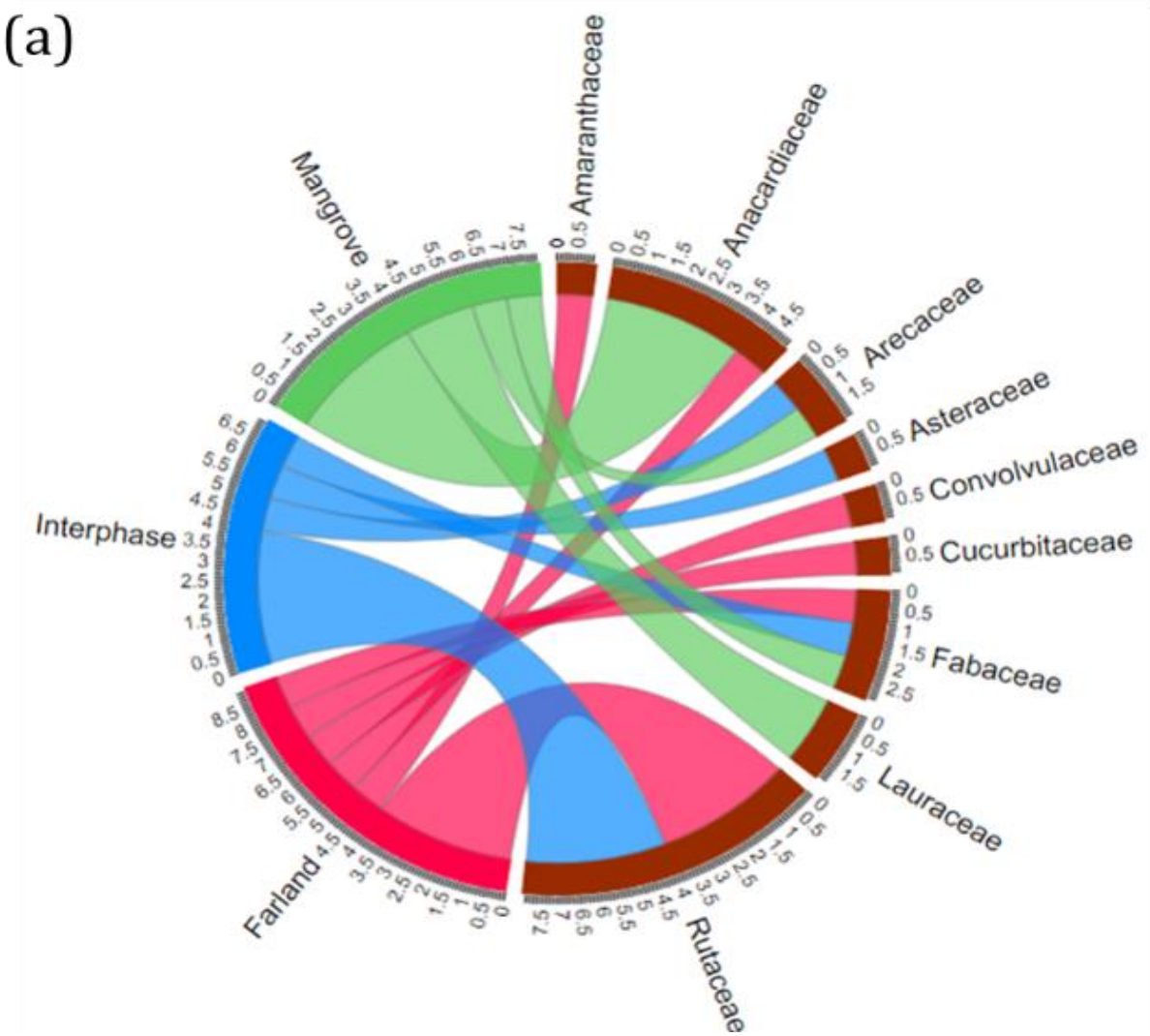


Microbiome composition seems to vary according to the biotope

(Bouaka et al, 2022; 2024),

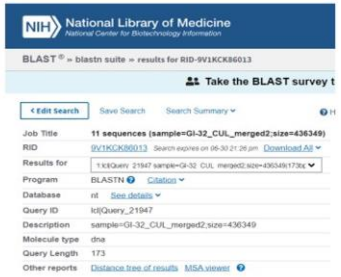
RESULTS

Interaction with plants



(Solano et al.,2015)

Glossin sequences process



Plant meals detected by haplotypes in the general sample:

- *Neolitsea umbrosa (arbusto/barrancos,arroyos)*
- *Witheringia spp. (hierba mora)*
- *Cinnamomun spp.*
- *Mangifera spp. (mango)*
- *Citrus spp.*
- *Persea schiedeana (aguacate)*

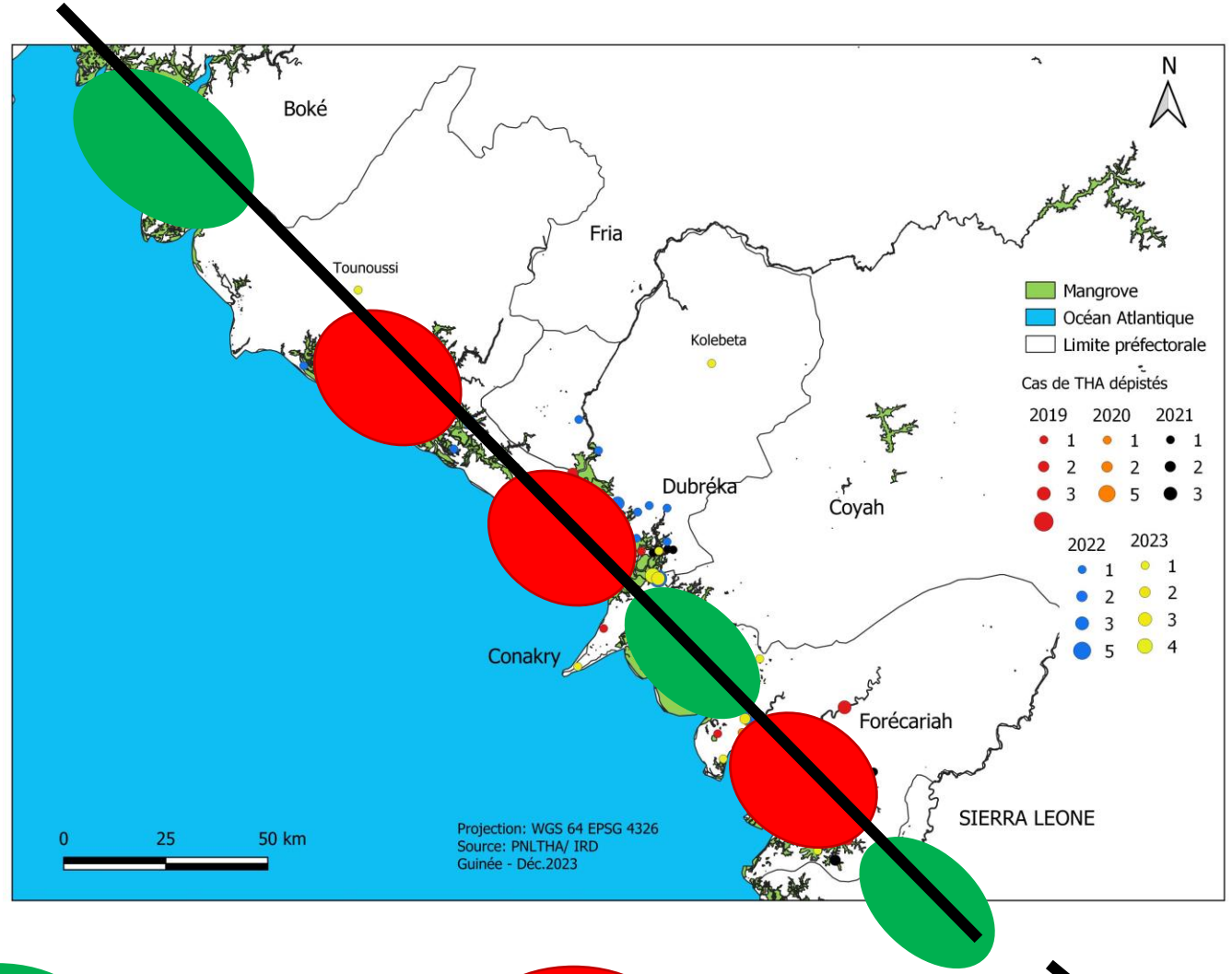


Real Plant contact or contamination events?

	Habitat			18s Locus Analysis			
	Mangrove	Interface	Farmland	Species	Genebank#	Expect	Identities (%)
Number of flies caught	2	1	1	*T.grayi*	MK756193.1	8.00E-69	147/147 (100%)
	0	0	1	*T.vivax*	KM391821.1	3.00E-68	146/146 (100%)
	0	0	2	*Neobodo designis*	AY753605.1	2.00E-64	143/145 (99%)
	0	0	1	*Bodo saltans*	AY490227.1	4.00E-62	143/147 (97%)

Free-living Trypanosomes in nectar plant?

PERSPECTIVES



Can we explain the contrasted epidemiological status in the mangrove areas through MBC approach?

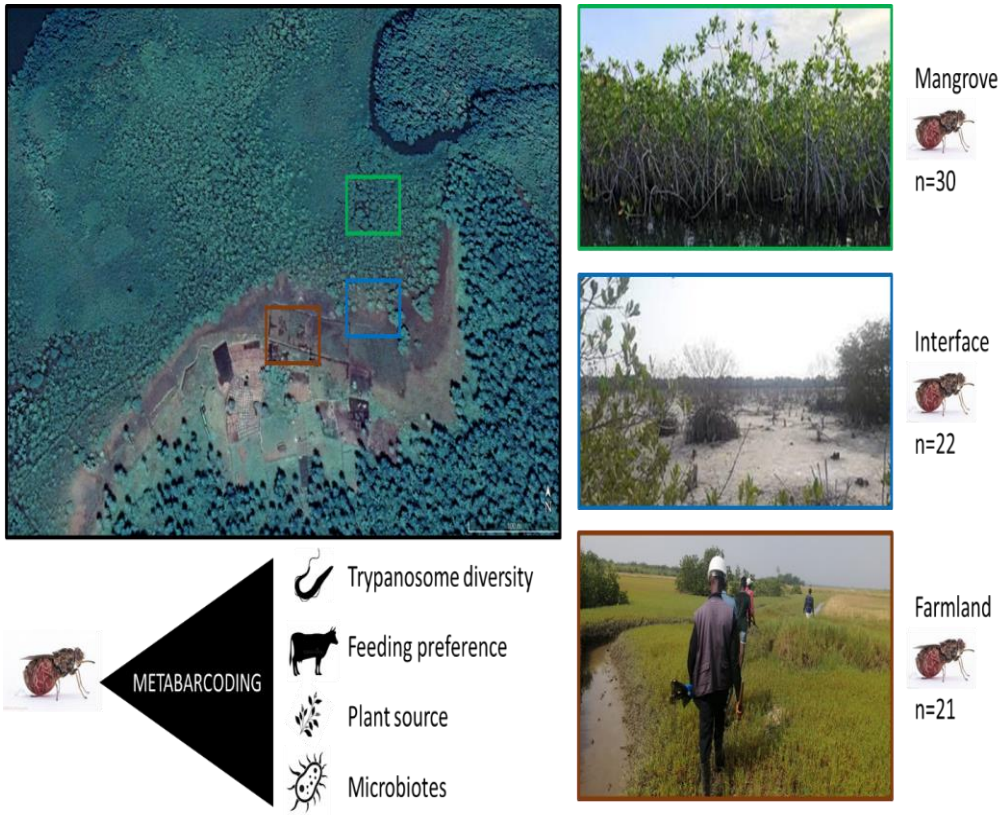
No Tbg Human transmission

Tbg Human transmission

Tsetse fly sampling transect

CONCLUSION

Ecological behaviour of tsetse flies according to their habitats:



Are the anthroponotic, peri-domestic and sylvatic cycles connected?

Strong bio-ecological differences flies from Mangrove vs flies from Interface/Farmland

No apparent connections between sylvatic, peri-domestic and anthropic cycles

Is a sylvatic cycle able to maintain *Tbg* circulation?

If yes, ***Tbg* spillover risk** from wild animals to human seems **low**.

MBC, a capacity building story



MBC#1 (Conakry, June 2022)



MBC#2 (Conakry, Sept 2023)

Guinea
Cameroon
Ivory Coast
Burkina Faso
Mexico
France





MBC#3 (Conakry, Oct 2024)