

REPORT FIELD MISSION – GUINEA BISSAU

eDNA sampling

22nd May – 1st June



The eDNA research team (fltr): Pieter-Jan Keleman (PhD Student ISA), Assana Camara (CIPA), dr. Jacques Panfili (IRD), dr. Jean-Dominique Durand (IRD).

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Introduction

This field trip to Guinea Bissau was made between 22nd of May to 1st June of 2021 within the context of the PhD research line of the student Pieter-Jan Keleman (Ethnobiology-ISA). The main purpose was to collect water samples during the dry season for environmental DNA (eDNA) analysis afterwards. PhD student Pieter-Jan Keleman was assisted by his supervisor Dr. Jacques Panfili and his colleague Dr. Jean-Dominique Durand from the Research Institute for Development (Institut de Recherche pour le Développement - IRD) and the Research Unit MARBEC (MARine Biodiversity, Exploitation and Conservation) in France and Asanna Camara, a researcher from the Applied Fisheries Research Institute (Centro de Investigação Pesqueira Aplicada – CIPA) in Guinea Bissau.

In the mentioned period, the three selected villages (Elalab, Cafine and Malafo) for this PhD topic were visited in their respective regions (Cacheu, Tombali and Oio). The main goals of this mission were:

- To select one village (Malafo or Ntchugal) in the Oio region to be included for this PhD research.
- To collect water samples following a strict protocol by NatureMetrics Ltd. (UK company that will perform the eDNA analyses afterwards) for three villages spread over three different regions (Cacheu, Tombali, Oio).
- To collect the water samples inside three different socio-ecosystems: rice fields, a transition zone between the rice fields and the mangrove area, and natural / less human-impacted mangrove areas along the main river.
- To collect some fish tissue samples on local markets (or fish landings) for barcoding analysis.



Elalab village (Cacheu region)

Selected Study Sites



Geographical localisation of study sites on Guinea Bissau map: Elalab (Cacheu region), Malafo (Oio region), Calfine (Tombali region).

Day-to-Day Schedule

Date	Stakeholders*	Region	Village	Activity
22/05/2021	PJ	Bissau	/	Departure from Lisbon to Bissau
23/05/2021	PJ	Bissau	/	Logistical arrangements and field preparation: <ul style="list-style-type: none"> Meeting with Car driver Sadjo Mamadu Camará Buying of needed equipment Meeting with Asanna Camara (CIPA) in Hotel Império
24/05/2021	PJ	Oio	Ntchugal	<ul style="list-style-type: none"> Meeting with YFR Dinis Mbaque M'bana, and the local community Field exploration: rice fields and mangroves
25/05/2021	<div>PJ</div> <div>JP, JD</div>	<div>Oio</div> <div>Bissau</div>	<div>Malafo</div>	<ul style="list-style-type: none"> Meeting with YFR Pedro Na Onça, and the local community Field exploration: Rice fields and mangroves Visit to the port of Enxalé (nearby village) Evening: arrival of JP, JD in Bissau
26/05/2021	PJ, JP, JD, AC	Cacheu	Elalab	<ul style="list-style-type: none"> Transport from Bissau to Susana port by car, boat transport from Susana Port to Elalab

				<ul style="list-style-type: none"> Meeting with 2 YFR's: Mario Songo and Rui Calês Djata, and the local community Collection of water samples inside Fishing ponds and Transition zone Visit to the Rice field «Ilha de Bolanha» Stay inside ecolodge in Elalab
27/05/2021	PJ, JP, JD, AC	Cacheu	Elalab	<ul style="list-style-type: none"> Collection of water samples inside Rice fields Collection of water samples inside Mangrove river Collection of fish tissue samples in fish landing Transport from Elalab to Susana Port by boat, transport from Susana Port to Bissau by car
28/05/2021	PJ, JP, JD, AC	Tombali	Cafine	<ul style="list-style-type: none"> Transport from Bissau to Cafine by car Meeting with 3 YFR's: Tchanate Midana Na Iole, Intam-laba Na Ncobna, N'djif Na Ghol, and local community Collection of water samples inside Rice fields, Transition Zone and Mangroves next to main river Stay in ecolodges in Jemberem
29/05/2021	PJ, JP, JD, AC	Tombali Oio	Jemberem Malafo	<ul style="list-style-type: none"> Transport from Jemberem to Bissau, stop in Malafo Logistical arrangements in Malafo: boat transport for water sample collection Stay in Bissau
30/05/2021	PJ, JP, JD, AC	Oio	Malafo	<ul style="list-style-type: none"> Transport from Bissau to Malafo by car Collection of water samples inside Mangrove river, Transition zone and Rice fields Stay in Bissau
31/05/2021	PJ, JP, JD	Bissau	/	<ul style="list-style-type: none"> Digitalization of field data and notes Covid test in Bissau Final arrangements with driver and AC
01/06/2021	PJ, JP, JD, AC	Bissau	/	<ul style="list-style-type: none"> Visit to the fish market and harbour in Bissau to collect fish tissue samples for barcoding analysis Visit to the Bandim market Flight from Bissau to Lisbon (PJ), and Montpellier (JP, JD)

*Pieter-Jan Keleman (PJ), Jacques Panfili (JP), Jean-Dominique Durand (JD), Assana Camara (AC).

Conclusions

- Despite the tight schedule, we were able to collect all water samples (n=27) in all three villages for eDNA analysis.
- Pieter-Jan Keleman selected the village of Malafo in the Oio region for his study, because of the larger extent of the river and mangrove area, connection with the local community and because of the fact that farmers use pesticides in the rice fields. Therefore, for the eDNA analysis in Malafo, we will also include plankton, crustaceans, molluscs and bacteria to get a general overview of the pesticides effect on aquatic biodiversity. For Elalab and Cafine, eDNA analysis will only target fish biodiversity.
- A total of 34 fish tissue samples were taken in Elalab (Cacheu), Cafine (Tombali), Malafo (Oio) and on the fish market in Bissau.

Gallery

Ntchugal + Malafo (Oio) – field exploration



Pieter-Jan Keleman and YFR Diniz in Ntchugal



Visit to the rice fields with YFR Pedro in Malafo



Port of Enxalé

Elalab (Cacheu)



The kids of Elalab helped us a lot by transporting our equipment to the rice fields!

Transport by motorboat from Susana Port
to Elalab



Ecolodge in Elalab: comfy and cozy

We distributed (leftover) syringes among the kids
so they could play with it.



Sampling spot inside the Rice Fields
of «Ilha de Bolanha»

Cafine (Tombali)



Playing with the kids

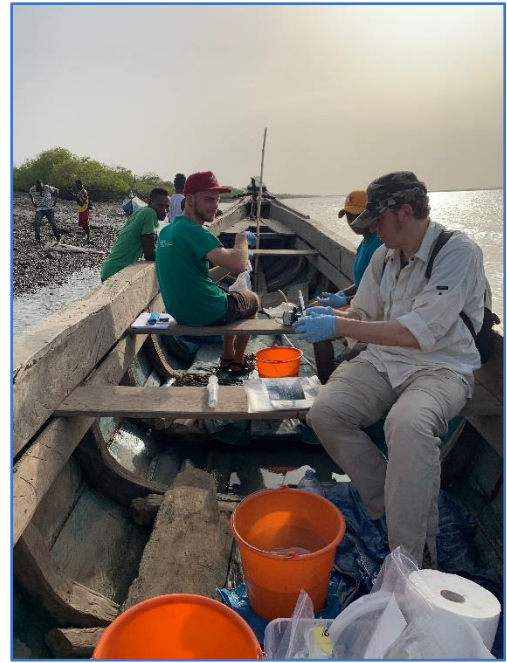
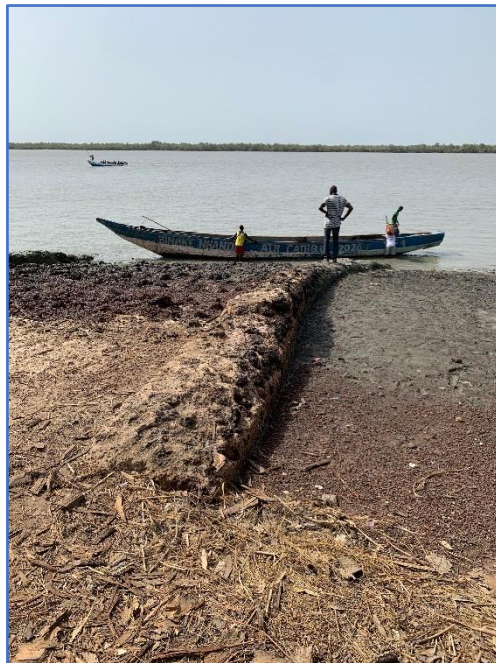


Ecotourism
lodges in
Jemberem



Rice fields (left) and Transition Zone with the mangroves (right)

Port of Cafine
(left) and eDNA
sampling inside
a motorboat
(right)



Malafo (Oio region)



Transportation of the
equipment by walking
for hours under the sun:
a challenge!



Sampling location for the Natural Mangrove socio-ecosystem. Fishermen arrived by canoe so we could also take some fish tissue samples



Sampling location inside the rice fields

Bissau



Fish market



Port of Bissau