



# Analyzing variations and Diversity of Diatom Communities for a River Ecosystem health diagnosis

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## BACKGROUND:

70% *Earth Surface occupied by water*

*Less than 1% of this is liquid water containing streams, rivers and lakes*

-1%

+ 15,896 *Diatoms species identified according to Algaebase (Karsten, 2020)*

*These are cosmopolitan species but for Madagascar there is a very scarce data*

## PROBLEMS:

Diatoms have a long history, very advanced in Europe and US but not for Madagascar. Basic investigations are very scarce and data are very rare.

## RESEARCH QUESTION:

- ❖ How can we investigate the diversity of diatoms in a particular aquatic ecosystem like a river?
- ❖ Can we infer the water quality or the river health with the obtained data of Diatom occurrences?

## HYPOTHESIS:

- ❖ The diversity of diatoms in a river is dependent on variations of seasonal and environmental parameters influencing communities structure and species occurrence
- ❖ Variations between diatom communities can relate a particular quality level of the river as an ecosystem

# Methods and Process

Indices of Ecosystem Health Assessment based on diatom Communities variations

## Bibliographic Synthesis

What have been done in the field study and what is the case of Madagascar.



## Existed Data Extraction

Taxons Occurences cited from Madagascar or Ecological Preferences of each species or Genera.



## Ecosystem Health Indices

Inferring the Ecosystem Health by using identified genera coupled by physical and Chemical parameters as ecological preferences.



## Field Sampling

In a River with a dynamic flows (Lotic Ecosystem), we sample diatoms from rocky substrates, bringing around 100mL per site



## Microscope Observation

With Light Microscopy we can compare global morphology of each genera or similar groups but for further identification we need EM and DNA analysis



## Identification and Indexation

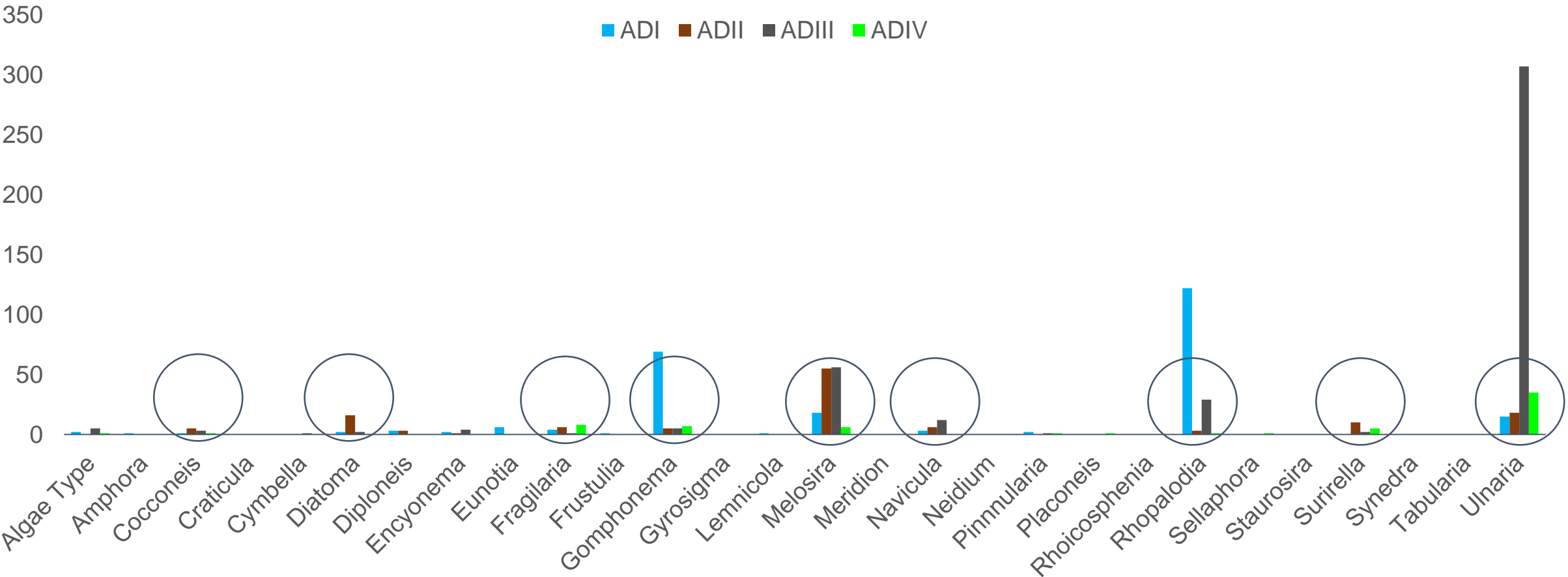
Identication is done using ID keys from European DCE or Canadian Protocols, or North America Catalogue



# RESULTS OVERVIEW

488 Microscope Slides  
27 Identified Genera

Global Occurrences of Diatom Taxons on 4 sites in Ankarahara River





# DISCUSSION

## INFERRING THE GLOBAL RIVER ECOSYSTEM HEALTH

By comparing diatom index and sensitivity with other aquatic indicators (Insects, Macrophytes, Fishes) can we generate an insight of the quality of the River considering the ecological integrity and the capacity of auto epuration.

## PERFORMING INDICES BY THE METABARCODING

To highlight the diversity of Diatoms in flowing water, high accuracy of species level Identification is needed. And in the case of Madagascar, the specific richness leads to considerate the high diversity in species level



***Thank you***

