



Technology transfer: 2nd part

F. Rimet

Feedback from diatom
metabarcoding

The INRAE logo is located at the bottom left of the slide. It consists of the letters "INRAE" in a bold, teal-colored, sans-serif font. The letter "E" is stylized with a circular element at its top right corner. The logo is partially overlaid by a large, rounded hexagonal shape that transitions from light green to dark teal.



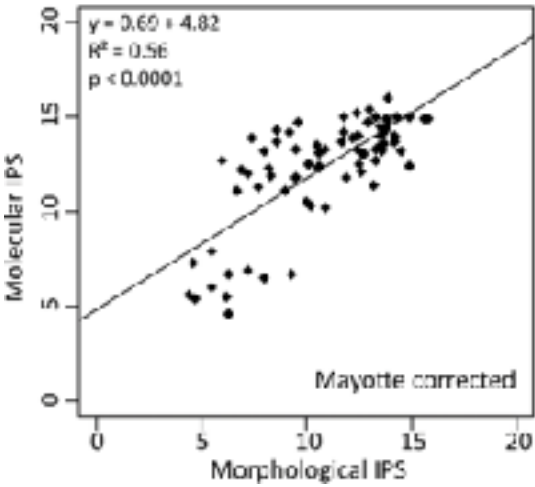
Technology transfer: Feedback from diatom metabarcoding

Schedule

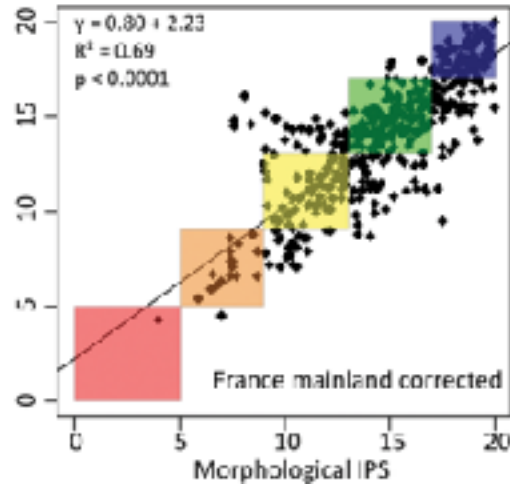
Proof of concept,
Open access publications,
Protocols,
Standardisation,
Spin-off company
Courses
Mentoring
Application in monitoring networks



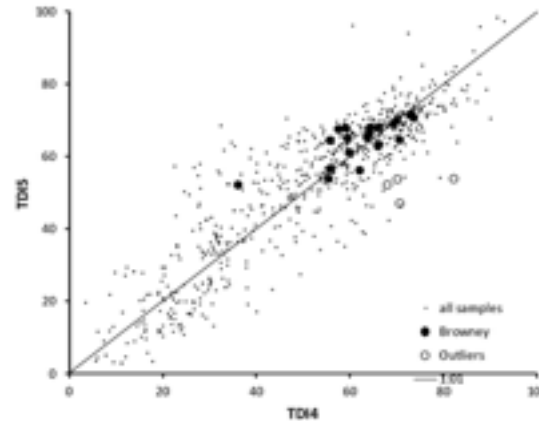
Mayotte



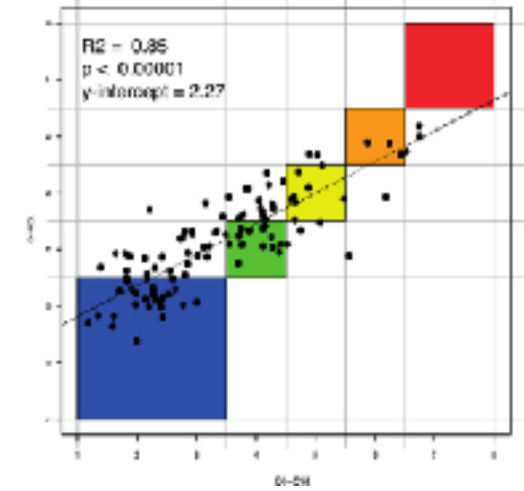
France



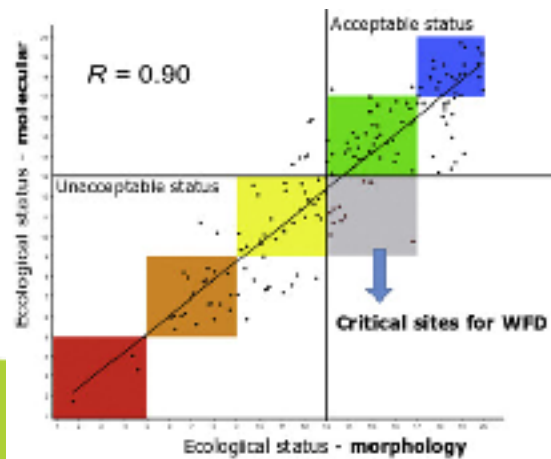
UK



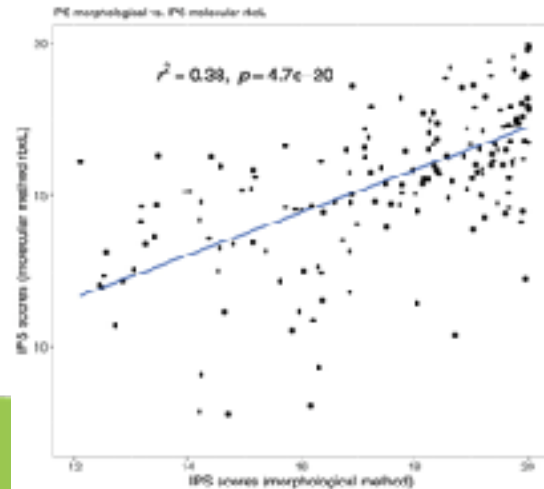
Switzerland



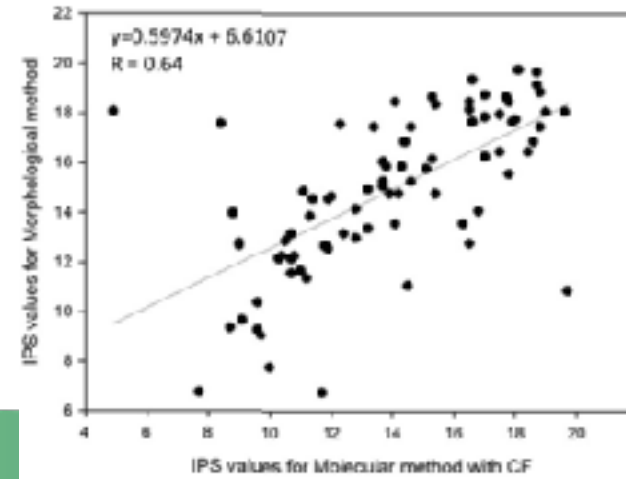
Spain



Sweden



Portugal



Test of the approach but not formally accepted by water managers (except for UK)

Open access publications

How to create a reference Barcode library (*Zimmermann et al. 2014, Rimet et al. 2016, CEN TR 17244 2018*)

Reference library « Diat.barcode » (*Rimet et al. 2015, 2016, 2018, 2020*)

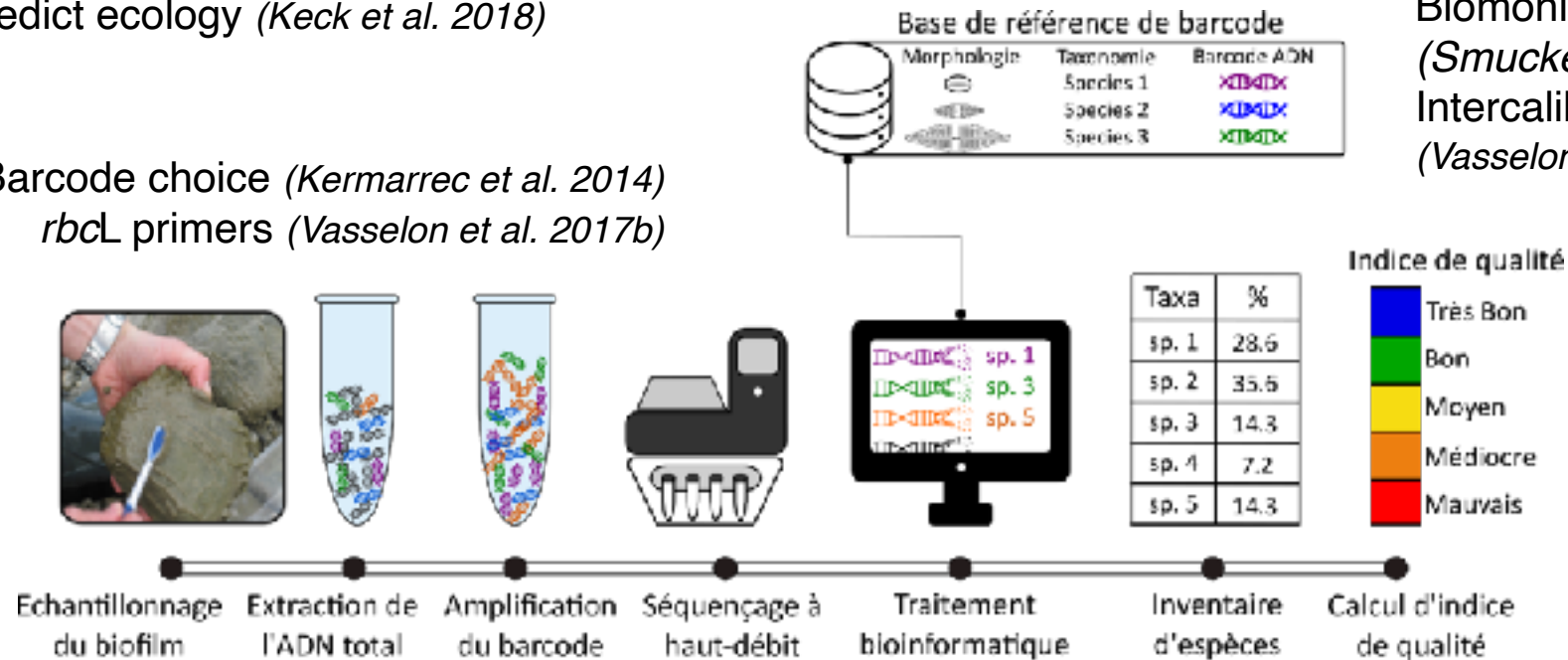
Strategy to complete a library (*Rimet et al. 2018*)

Use of phylogeny to predict ecology (*Keck et al. 2018*)

Biomonitoring N/P
(*Smucker et al. 2022*)
Intercalibration
(*Vasselon et al. 2023, in prep.*)

Barcode choice (*Kermarrec et al. 2014*)
rbcL primers (*Vasselon et al. 2017b*)

Sampling
(*CEN TR 17245 2018*)
Preservation
(*Baricevic et al. 2022*)

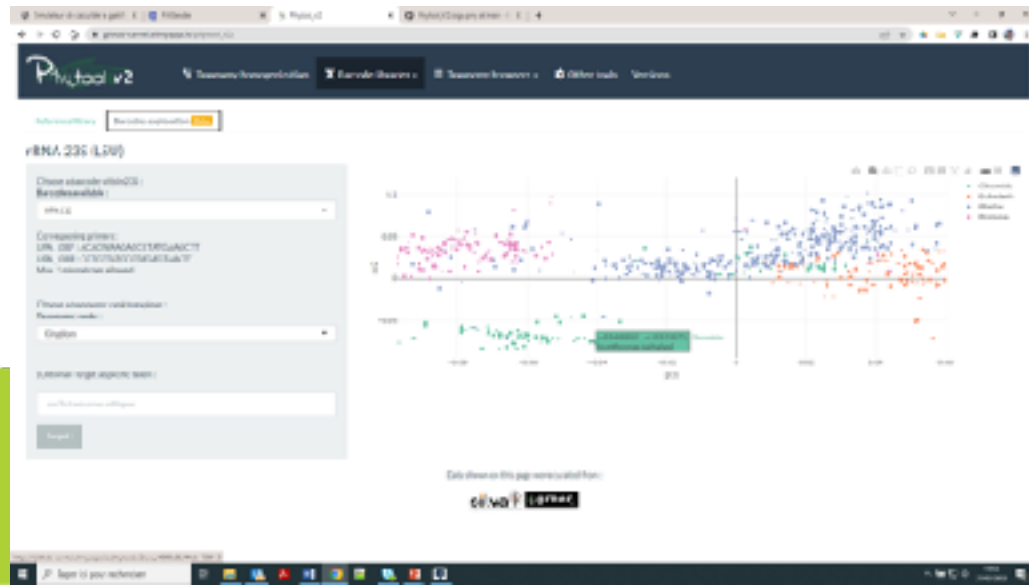



Freshwater biodiversity
(*Deiner et al. 2015*)
Diatoms
(*Vasselon et al. 2017a*)

Comparison of pipeline
(*Bailet et al. 2020, Rivera et al. 2020*)

Correction factor
(*Vasselon et al. 2018*)
Taxonomie-Free index
(*Tapolczai et al. 2020*)

Open access protocols and tools





VERSION 1
JUN 11, 2020

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WORKS FOR ME 1


River biofilms sampling for both downstream DNA analysis and microscopic counts V.1

DOI
dx.doi.org/10.17554/protocols.io.bentjdhe

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EcoALpsWater

 Cedric Chardon

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TECHNICAL REPORT
RAPPORT TECHNIQUE
TECHNISCHER BERICHT

CEN/TR 17245

August 2018

EN 15446:2018

English Version

Water quality - Technical report for the routine sampling of benthic diatoms from rivers and lakes adapted for metabarcoding analyses

Qualité de l'eau - Rapport technique pour l'échantillonnage en routine de diatomées benthiques dans les rivières et les plans d'eau adaptés pour les analyses de métabarçodage

Wasserqualitätstechnik - Technische Dokumentation für die Routine- und Standard-Metabarçodage-Analysen

T18 - Technical Report as approved by CEN on 11 May 2018. It has been endorsed by the Technical Group(s) CEN/TR 280.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.

- Already existing documents (TR for diatoms)
- Ongoing effort in CEN



CEN Documents

CEN/TC 230/WG 28 "DNA and eDNA methods"

- European project: eDNAqua-plan



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPEEN DE NORMALISATION
EUROPEISCHES KOMITEE FÜR NORMUNG

nion

- Company with former PhD of our research unit
- Propose eDNA analyses and trainings



The screenshot shows the SCIMABIO interface website. The header includes the SCIMABIO logo (a fish in a circle) and the text "SCIMABIO interface science-management interface for biodiversity conservation". Navigation links include Introduction, Activities, Tools, Services, References, Publications, and Contact, along with a French flag icon. The main content area is titled "Actualités" and features a post about diatom eDNA biomonitoring for river conservation, dated 9 September 2019. The post includes a small image of diatoms and a blue checkmark icon. Below the post are logos for SCIMABIO, INRA, CARTEL, and Rivières Sauvages. A search bar and a "Recent Posts" section are also visible on the right side of the page.

- We give courses regularly
- Lecture + practical courses (molecular lab + bioinformatic)



Metabacoding course: 7 to 10 November 2022



4 to 6 February 2020

- Question we (scientists) got from the water managers:
- You scientists have the technology and methodology ready, you gave courses to private offices, you gave them your protocoles, the tools ...etc...

but

- Do the these people apply correctly your protocols when they are back to their lab?
- How do the traditional analysts (microscopist) will find their place in this new methodology?
- Necessity:
 - to mentor the labs who want to propose these new analyses to clients
 - to have a certification/accreditation process (to ensure results quality to the client)



Application to monitoring networks

- Experience from diatom metabarcoding in France
- Almost all transfer steps are achieved
- What can delay the application of diatom metabarcoding to official networks?



- **Experience from diatom metabarcoding in France**
- Almost all transfer steps are achieved
- What can delay the application of diatom metabarcoding to official networks?
 - Water managers:
 - Long legacy of diatom biomonitoring (several decade): don't want to change method to keep the chronicle intact
 - are afraid to loose hydrobiology/taxonomy skills in private and public labs
 - wonder if sequencing labs will apply correctly the protocols
 - wonder if there will be enough molecular labs to realize all the analyses
 - wonder if the DNA method won't "artificially degrade" the quality of rivers
 - Some diatom analysts and hydrobiology labs:
 - don't want to see DNA replace them. They will loose their job
 - there is more waste (plastic) with DNA methods.

Things can take more time than expected...



Questions?

