



## WG1-3 Workshop "Expertise catalogue and Parasites Database-Online platform"

### Part 1: WG1 Workshop "Expertise catalogue and Parasites Database-Online platform"

12<sup>th</sup> December 2022

By *Andrea Tarallo*



On the 12<sup>th</sup> of December, the first session of the two-days WG1-WG3 joint workshop took place online – the second part will be held on the 16<sup>th</sup> of December from 13.00 to 15.00 CET.

The first part was hosted by the WG1 Italian partners Andrea Tarallo and Ilaria Rosati from LifeWatch Italy (National Research Council of Italy). The main activity was focused on the *in situ* and experimental data mobilisation and to the collaborative drafting of the first Data Management Plan of our Action.

During the workshop, the participants had the chance to actively work on their own datasets, harmonising them with world-recognised standards, and thus setting the basis for the building of the ParAqua database, in which all the data will be accessible and reusable.

To ensure the preservation and reusability of the data, the participants drafted a Data Management Plan. In the next weeks, the document will be polished, and upon approval by the Action members, it will be published as a public document. The document will serve as an internal guideline, but also for external researchers that want to understand how we manage our data.

On the same day, Albert Reñé (WG1 leader) led a session dedicated to the paper on parasite occurrences. The meeting was the occasion to share the responsibilities around the data collection for zoospore parasites on algae and to make a decisive step forward for the advancement of this activity.

(In the picture above, Dr. Orhideja Tesesvska and Dr. Elizabeta Veljanoska Serafiloska from PSI Hydrobiological Institute, Ohrid moderators of the breakout room session in environmental drivers)

## Part 2: WG3 Workshop "Expertise catalogue and Parasites Database-Online platform"

16<sup>th</sup> December 2022

By *Francisco Gabriel Acien Fernandez*



On December 16<sup>th</sup>, 2022, the second part of the workshop related to the identification and control of parasites in large-scale microalgae production systems was performed as part of the WG3 PARAQUA COST action. The workshop was organized by the University of Almería and performed virtually. Experts from both academia and industry analyzed the most promising techniques to identify this type of problem affecting the reliability of large-scale microalgae production systems. A survey to identify the major challenges and opportunities in this field was prepared, discussed and disseminated among the participants, and now it is spread to the research centres and companies related to this sector. It is expected to collect and analyse the responses before middle of January 2023, when a workshop with the complete set of stakeholders involved in the project will be performed.

Prof. Francisco Gabriel Acien Fernandez, the WG3 workshop leader presents Survey about microalga parasites in production systems



Ana Sanchez Zurano presented possibilities of chytrids detection and quantification in algae samples, the lesson learnt during her stay on ParAqua STSM in IGM

## ParAqua members' impressions on STSM

### My experience in Lake Stechlin

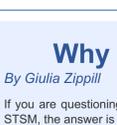
By *Ana Sánchez Zurano*



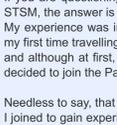
Last September, I had the opportunity to spend three weeks in the LakeLab in Lake Stechlin of Brandenburg, which is a large experimental setup of the Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB) located in the north of Germany. This experience began several months ago when I was awarded with a Short-Term Scientific Mission (STSM) from the ParAqua Cost Action to learn about chytrid fungal parasites of algae in the Dr. Hans-Peter Grossart group. I landed at the Berlin airport on September 8, very excited to get to know Lake Stechlin, and enjoy the atmosphere of its surroundings. And I'm definitely not disappointed, the lake and all its trails are impressive to explore by bike or on foot (photos of the lake).



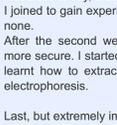
However, what impressed me more was the IGB international research center. The center is located in an unbeatable place next to Lake Stechlin, where students and researchers from all over the world work to understand, from different backgrounds, the complexity of these aquatic systems and to use this knowledge to support the sustainable management of water-based resources and ecosystems (photo IGB).



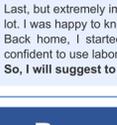
Specifically, my stay was focused on the identification of chytrid parasites that infect microalgae cultures at different stages, to "hunt" them in samples that I had brought preserved in lugol from the SABANA Microalgal Demo Plant located in Almería (Spain). The main technique we used was fluorescence microscopy using two different stains. Calcofluor White (CFW) staining approach along with epifluorescence microscopy (WGA, green fluorescence) was used to detect and identify fungal parasites attached to an algal host.



In turn, molecular analyses were carried out to determine the presence of fungi in samples from Almería. For this purpose, samples were obtained from three 80 m<sup>2</sup> raceways reactor operated with *Arthrospira platensis*, an 80 m<sup>2</sup> reactor with a mixture of green algae and freshwater with fertilizers, and an 80 m<sup>2</sup> raceway reactor operated with a mixture of green algae and urban wastewater from the University of Almería. The possible presence of fungi was studied by PCR amplification using specific primers. For this purpose, DNA was extracted and the amount of DNA present in the samples was quantified. Next, the PCR was performed, and the possible amplification was evaluated using an agarose gel.



Working with the IGB researchers was very gratifying and being able to learn all these techniques was very useful to continue my research career focused on the production of microalgae for different industrial applications, which is strongly conditioned by the presence of possible predators that cause the loss or failures of these systems.



Also, apart from my great scientific experience with Prof. Hans-Peter and the other group members, I really enjoyed on a personal level the people I met at the center and at the guest house, with different scientific backgrounds, but above all very friendly. Thanks to them, I was able to enjoy an experimental campaign day on the lake, a game of football and a barbecue!

Thank you very much for this opportunity and I hope to return soon!

## Why should you take part in an STSM?

By *Giulia Zippilli*

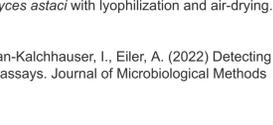
If you are questioning if participating in one of the COST STSM, the answer is simple - YES! My experience was in Tartu University, Estonia. This was my first time travelling for university project, and although at first, I was a little bit hesitant I eventually decided to join the ParAqua project.



Needless to say, that this was a wonderful experience. I joined to gain experience in the laboratory because I had none.



After the second week I acquired knowledge and I felt more secure. I started to use equipment on my own, and I learnt how to extract DNA from sediment. Also, I learnt how to perform a PCR correctly and how to use electrophoresis.



Last, but extremely important, I've interacted with other people, other scientists and professors, who taught me a lot. I was happy to know more about a country which is a little bit far from mine.

Back home, I started my master dissertation project and by preparing sediment sampling in the lab I felt confident to use laboratory equipment, how to behave in a lab, and to safely handle things. So, I will suggest to everyone to try and have an experience of this kind!

## Recent publications of ParAqua members

### The new chytridiomycete!

By *Albert Reñé*

In this study, the new chytrid genus and species *Paradinomyces trifloraminorum*, detected during a *Kryptoperidinium foliaceum* (Dinophyceae) bloom in the Baltic Sea, is described. This species showed high specificity for *K. foliaceum* and co-occurred with three other Chytridiomycota and Perkinsea parasites. All parasites compete for the hosts, impacting the development of the dinoflagellate bloom.

You can read more by searching this reference: Reñé, A., Alacid, E., Vishnyakov, A.E., Seto, K., Tsvetkova, V.S., Gordi, J., Kagami, M., Kremp, A., Garcés, E., Karpov, S.A. (2022) The new chytridiomycete *Paradinomyces trifloraminorum* gen. et sp. nov. co-occurs with other parasitoids during a *Kryptoperidinium foliaceum* (Dinophyceae) bloom in the Baltic Sea. *Harmful Algae*, 120: 102322

[Link to publication.](#)

## Detecting aquatic pathogens with field-compatible dried qPCR assays

By *Irene Adrian-Kalchauer*

In this paper authors described how they developed, validated, and tested the shelf-life of qPCR assays targeting *Gyrodactylus salaris* and *Aphanomyces astaci* with lyophilization and air-drying.

You can read more by searching this reference: Rieder, J., Martin-Sanchez, P.M., Osman, O.A., Adrian-Kalchauer, I., Eiler, A. (2022) Detecting aquatic pathogens with field-compatible dried qPCR assays. *Journal of Microbiological Methods* 202: 106594 or just click here:

[Link to publication.](#)

## Vertical and temporal distribution of chytrids infecting diatoms in the Gulf of Naples (Italy, Mediterranean Sea)

By *Albert Reñé*

In this paper authors demonstrated the presence of Chytridiomycota predominantly in the upper layers coinciding with the vertical distribution of diatoms.

You can read more by searching this reference: Reñé, A., Timoneda, N., Sarno, D., Piredda, R., Zampicini, G., Zingone, A., ... & Garcés, E. (2022). Vertical and temporal distribution of chytrids infecting diatoms in the Gulf of Naples (Italy, Mediterranean Sea). *Marine Ecology*, e12726 or just click here:

[Link to publication.](#)

## Upcoming events – save a date!

### ParAqua Training school "Isolation and Drivers"

By *Ivana Trbojević*

We are organizing Training School "Isolation and Drivers" Where: Belgrade, Serbia When: 3<sup>rd</sup> and 4<sup>th</sup> of April 2023 Attendance: virtual or on-site – eligible for COST reimbursement

Lectures and practical trainings related to the following topics will be held

- Isolation of zoospore parasite strains and their characterization
- Algal-parasites cultivation (micro and macro-algae, cyanobacteria) and conservation for culture collection
- Methods to investigate drivers of zoospore parasite infections

Organizing Committee: Ivana Trbojević (local organizer, University of Belgrade) Serena Rasconi (Action Chair) Hans-Peter Grossart (co-organizer, IGB) Saba Van den Wynngaert (co-organizer, University of Turku) Albert Reñé (co-organizer, ICM-CSIC, Barcelona)

The program and the call for trainees will be announced soon. Stay tuned ☺ Looking forward to meeting you in Belgrade!

## Aquatic Sciences Meeting

By *Hans-Peter Grossart*

ASLO Aquatic Sciences Meeting 4–9 June 2023 Palma de Mallorca, Spain **Fungi in aquatic ecosystems: structure, function and health**

This session will stimulate a cross-ecosystem and cross-taxa synthesis of aquatic fungi in all their forms and functions, including showcasing recent technological advances to promote wider update across the aquatic mycology field; aquatic sciences in general, and across fundamental and applied interests. This session covers all aquatic ecosystems, from freshwater ponds, lakes and rivers to estuaries, coastal marine waters, and the open deep ocean, ranging from tropical to temperate and polar regions including sea ice. The session is open to the full taxonomic diversity of aquatic fungi, including hyphal and yeast forms, aquatic lichens and zoospore groups, such as chytrids, as well as fungal-like organisms (e.g. Oomycetes). We welcome those working both in the field and with model laboratory systems (e.g. cultures), across the range of aquatic functional roles (e.g. phytoplankton parasites, saprotrophs, symbionts) and diversity-focused studies (e.g. eDNA-based, isolation of new species).



Key Dates January 2023 - Call for Abstracts Posted - Registration Opens February 2023 - Abstract Submission Deadline - Early Registration Ends March 2023 - Presenters Notified of Acceptance - Program Schedule Posted Further details and abstract submission - <https://www.aslo.org/palma-2023/>

Co-chairs: Michael Cunliffe - Marine Biological Association & University of Plymouth [micnbl@mba.ac.uk](mailto:micnbl@mba.ac.uk) Federico Baltar - University of Vienna [federico.baltar@univie.ac.at](mailto:federico.baltar@univie.ac.at) Serena Rasconi - Université Savoie Mont Blanc [Serena.Rasconi@inrae.fr](mailto:Serena.Rasconi@inrae.fr) Eva Breyer - University of Vienna [eva.breyer@univie.ac.at](mailto:eva.breyer@univie.ac.at) Hans-Peter Grossart - IGB-Berlin [hanspeter.grossart@igb-berlin.de](mailto:hanspeter.grossart@igb-berlin.de)

## Announcements

**ParAqua Contact Point** **Elodie Babu** Please contact Elodie for your questions related to refunding and working modalities for Activities participation [elodie.babu@inrae.fr](mailto:elodie.babu@inrae.fr)



## News from PARAQUA Management

### Main Contacts and Leadership

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**WG4 leader** **Position opened!**

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Lorna Stokes

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*Newsletters: we distribute a bi-monthly newsletter, sign up (form located at the bottom of our website homepage)*



**ParAqua Newsletter #6 – December 2022 –**  
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