Evaluation of the Research and Professional Activity of the Institutes of the Czech Academy of Sciences (CAS)

for the period 2010–2014

Final Report on the Evaluation of the Institute

Name of the Institute: Institute of Botany of the CAS, v. v. i.,Pruhonice

Fields, in which the Institute registered its teams:

Biological sciences including biotechnology and agricultural sciences

Observer representing the Academy Council of the CAS: Vladimír Mareček

Observer representing the Institute: Tereza Chýlová

Commission No. 7: Biological sciences including biotechnology and agricultural sciences

Chair: Emeritus Professor Erick Vandamme

Date(s) of the visit of the Institute: November 2 - November 11, 2015

Programme of the visit of the Institute: see attached Minutes from the visit

Evaluated research teams:

No. 1 - Department of Invasion Ecology & Department of GIS and Remote Sensing; No. 2 - Department of Taxonomy & Department of Flow Cytometry; No. 3 - Department of Population Ecology; No. 4 - Department of Genetic Ecology; No. 5 - Department of Mycorrhizal Symbioses; No. 6 - Centre for Phycology; No. 7 - Department of Functional Ecology; No. 8 - Department of Vegetation Ecology; No. 9 - Department of Experimental Phycology and Ecotoxicology

A. Evaluation of the Institute as a whole

1. Introduction

The Institute has a focus of fundamental research on the highest international standards on many areas of Botany working on species, populations and communities levels, combining traditional and modern research approaches. IB covers many major current topics in taxonomy, phytogeography of higher and lower plants Lichens, Fungi, Algae, Cyanobacteria all covered, plant ecobiology, including biodiversity and evolutionary trends among plants, ecology of invasive species, responses of plants and vegetation to environmental changes and the mechanisms that enable species to coexist in ecosystems. The continuum of research from Taxonomy through Ecology to Biotechnology gives IB a particular strength and they are naturally well positioned to address many important topics such as climate change. They will need to strengthen on genomics, modelling and databases.

IB provide important services such as the library, important collections, the Pruhonice Botanic garden and some databases and maintains the Pruhonice Park, a UNESCO World Heritage. Public services requires a large part of the budget, but also provides

some revenue (entance fees) that gives some flexibility. IB has a scientific journal, the Folia Geobotanica (IF1.6); employees of the IB are also editor-in-chief and editor of the journal Preslia (IF 4.1, published by then Czech Botanical Society).

IB is also commendable for their efforts to undertake applicable projects that have societal impacts on bioconservation, nature protection, fresh water protection (algal boom), biotechnology use of higher plants (natural rubber), algae and fungae, mycorrhizal symbiosis in agricultural productivity. There are 11 teams/departments (2 paired with others for the purpose of assessment in 9 teams). The budget is 184M CZK, approx. 6M Eur. We note a healthy spread of grant income generation among the 9 units.

2. Strengths and Opportunities

IB has a deeply rooted tradition in botany with complex expertise (field work and experimental). Only a few such Institutes remained in Europe. IB provide a good mix of fundamental knowledge generation, and applied aspects. IB makes a good use of the available infrastructure that is much less stunning in terms of instrumentation than some of the other institutes. They consolidated the collections in a central place, have field sites worldwide,and are also making important underpinning and background knowledge.

In particular, the Department of Invasion Ecology is of the highest, world standard, along with the Department of Taxonomy. Both have major modern research programmes, Petr Pysek is the 15th most cited scientist in plant sciences; Prof Komarek received the Behounek Award; V Jankovska the Mendel Medal , and B Marsalek tthe Czech Head Award.

The Institute's research paper output is impressive, and represent publications that solely or largely originated from activities of IB researchers. There has been a modest rise in grant income over the last three years. We were pleased to see that the institute has a good functioning management board. The Institute board is supportive of knowledge transfer and these scientists; doing excellent science for the society. Members of the Institute have good involvement in scientific journals, including as chief editors.

There is good flexibilities in the research structure of the institute and ample of collaborations within the teams. IB can become a keystone institute for research in historical and cultural landscapes related to climate change. The institute has attracted some EU funding, and in particular an ERC.

The director implements a good motivation policy, salaries have a base and motivational part: … XXX ... There is also some flexibilities in shifting resources to research groups.

3. Weaknesses and Threats

The leader of the highly evaluated Invasion Ecology programme would be an outstanding researcher to be attracted to any Institute or University in the world. Without him, the programme would be significantly weaker. Of the total budget of 184M CZK, it seems 147M CZK, nearly 70%, is spent on salaries. Clearly maintenance of a heritage building and gardens is labour-intensive, and the ecological research is not expensive in terms of consumables and equipment, but this is a high proportion. Noted that entrance fees can be used flexibly.

Stability of financing can be a challenge many of their projects are long term, and do not fit the typical 3 year grant schemes. Long term funding is needed for field work.

Internal evaluation is mainly focused on publcations , and to lesser extent on applcation outputs; insufficient motivation for transfer of knowledge (TOK) .

The Institute website needs improvement – from the scientific research side, it is very limited and does not showcase the whole institute research programme, publications and the researchers individually either in a way that international researchers will be wanting to consult or collaborate with .

Field studies are relatively expensive and do not lead to high profile publications or income that many evaluation strategies look at. However, critical that this work is properly recognized as the data underpins important botanical monographs and all future studies.

There is a substantial threath of a pull of mostly young scientists to new Centres away from the Institute of Botany - lots of equipment, competitive salaries. There needs to be a better integration of scientific efforts and policies among the traditional institutes such as IB with an undisputable legacy and scientific achivements and the newly created Centres from EU structural funds.

4. Recommendations

Maintain existing priorities: excellent of research; integrationof disciplines; integrate applied and fundamental research.
Involvement in more international projects.
Continue to attract excellent scientist from abroad – including as visitors or for collaborative projects
Build new expertise (e.g. combine epigenetics and cytogenetics)
Build more expertese in genomics/modelling/databases.
Maintain and increase on knowledge transfer to end users. Build more incentives that this activity is properly recognised.
Continue on the excellent work of popularization of research and strengthen education component.
Improve IB website for both scientists and public with scientific interests
Aim to gain further grants, particularly in collaborative projects.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

Many results generated by this Institute are excellent. Some of these represent leaders of their field at the international level. Great work is being published by the Institute scientists; some of this can be published in the most prestigious journals. We encourage staff to further their international profile through the organisation of international conferences and arranging sessions at key international events.

Declaration on the involvement of students in research

The involvement of students is excellent, there are international collaborations.

Declaration on societal relevance

Public engagement is good with the botanical gardens because over 120.000 annual visitors of the park are learning at the same time about the Institute of Botany and the botanical research.
However, the Institute website is weak, being outdated in areas, poorly ranked in Google, and not summarizing, at least in the international areas in English, the expertise of the scientists or research outputs.

IB organised many different events; in the period 2010-2014 there were nearly 300 media outputs, including 19 on TV. We commend the Institute for its technology transfer office. The Institute gets 0.5M in contract research, and has generated 3 licenced technologies. We recommend that the Institute considers generating a policy statement on how to recognise the value of applied research, so it can be appropriately considered alongside theoretical research.

Declaration on the position in the international and national context
The Institute is ambitious and its outputs are excellent.

Declaration on the vitality and sustainability
The Institute is ambitious to maintain and build upon their current position, as evidenced by recent applications to H2020 projects including to a large research infrastructure fund and an ERC advanced grant.

IB would be well positioned to lead collaborations/integrations with some of the newly funded academic institutes, such as the Global Change research centre.

Declaration on the strategy and plans for the future
A clear ambitious strategy for the future.

B.Evaluation of the individual teams

Evaluation of the Team No. 1: Department of Invasion Ecology & Department of GIS and Remote Sensing

1. Introduction

The group are international leaders in the biology of invasive species, carrying out groundbreaking and innovative science. They were the first to generate global comparison of invasive species (and essentially defined all the modern terminology), and the impact of their work is evidenced by an exceptional publication profile and citations (in 2014 and 2015, Pysek was rated one of the most highly cited ecologists). Their studies include developing models that predict patterns of invasiveness.

2. Strengths and Opportunities

The team is world leadering in an area of economic and biological importance. They have a wide range of publications in very appropriate journals, many collaborations, and their work has impact outside academia. They work from the local to the global scale: critical to having impact. Their publications are exceptional in bringing thoughtful analysis to the topic, based on rigorous collections and observational data. They are developing valuable classifiers and approaches to invasive species for the whole world.

3. Weaknesses and Threats

None apparent; it would be a challenge for the group if the leader were to move (a significant risk, although we would hope he could continue with extensive collaborations if it happened).

4. Recommendations

The work of the group is strongly supported, well-lead and addressing an excellent range of important questions based on top quality science. It would be very nice to see the research used further to help define policy for conservation and introductions with a rigorous scientific basis.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

This group has a superb publication profile, with papers in the top international journals PNAS (8 papers), Nature Communications, Annual Reviews series, Trends in Ecology and Evolution, Ecology Letters, Global Ecology and Biogeography, New Phytologist and commentaries in Science and Nature

Declaration on the involvement of students in research

With five PhD students currently, the number is appropriate for about 9 researchers and 5 long term visitors.

Declaration on societal relevance

The work is globally relevant, since invasive species negatively impacts ecology and agriculture, with significant economic consequences. The group has developed tools for handling invasive species and recommended by International Union for Conservation of Nature. The group has many outreach activities including TV programmes, radio broadcast and public lectures

Declaration on the position in the international and national context

Petr Pyšek was ranked as one of the most highly cited ecologists in the world by ISI in 2014 ; he became an Elected Fellow of the Learned Society of the Czech Republic in 2011. The group members are involved with editorial work and this is important for the scientific community.

Declaration on the vitality and sustainability

A very successful group which is likely to remain successful into the future. The age profile of the group is good. A very successful group, with implications for conservation and weed management.

Declaration on the strategy and plans for the future

The work they are doing and their future plans are excellent. GLONAF, a project started in 2011 (checklist of naturalised plant species from 843 regions, 3.9% of world flora) will be developed. They are addressing important questions with rigorous research.

Evaluation of the Team No. 2: Department of Taxonomy & Department of Flow Cytometry

1. Introduction

The team is a major centre of taxonomy of a broad range of plant groups. It provides an excellent combination of traditional taxonomy with molecular, cytogenetic and state of the art flow cytometry techniques. Large effort has been put into important flora monographs with Czech significance as well as other regions, such as China.

2. Strengths and Opportunities

They lead long-term projects and provide some unique botanical expertise. Combination and integration of traditional taxonomy with NGS and flow cytometry is powerful. Important outputs of their efforts are in monographs. This provide a great continuous service to the scientific community.

3. Weaknesses and Threats

Potentially they could be more ambitious in publication of research papers. Besides the monographs they clearly do excellent research projects,that could perhaps be published in higher impact journals.

4. Recommendations

Maintain their healthy balance between monographs and research outputs. Strengthen the sequence based and molecular approaches.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

The team is word leading in plant taxonomy as well as in applying flow cytometry methods in plant taxonomy and evolution. Monographs are one of the most prestigious outputs from the team, but they also have solid outputs in well recognised journals of the field, such as Annals of Botany, Molecular Ecology, Botanical Journal.

Declaration on the involvement of students in research

They have a healthy involvement of students in the research, good number of current projects and successful completion of bachelor (11) (master (12) and PhD (4). This is also reflected in a healthy age distribution of the group, having good ratio of young researchers.

Declaration on societal relevance

Botany and taxonomy have a natural connection with nature-loving society. They serve this public interest in an exemplary manner, e.g. with the development of apps for taxonomy that can be used by amateur botanists, pupils and students.

Declaration on the position in the international and national context

The group is word leading in several areas of traditional botany, providing expertise and services on an international scale. They also develop inventive methods in flow cytometry.

Declaration on the vitality and sustainability

The group has a stable composition with a good age profile and well defined goals. Research is grant funded and they received prestigious awards.

Declaration on the strategy and plans for the future

Maintain the traditional botany and privide a continious long term basis for this important research field. Underpin botanical studies with modern techniques.

Evaluation of the Team No. 3: Department of Population Ecology

1. Introduction

The group studies grassland ecology, population biology and evolution of polyploid systems, biotic interactions and determinants of exotic plant invasion success. The team is creatively combining traditional population biology approaches with some novel approaches and benefiting from collaborations with other groups within the Institute. Through this approach they work on a plethora of interesting topics and publish their results in well-recognised international journals.

2. Strengths and Opportunities

The team strength is in its adaptability in research methods and questioning. They adopted a rigorous scientific approached of elegant but simple experimental set ups that proved to be effective to complete their projects with excellent publications. They have ~8 researchers, majority is young (25-40) but they do have more experienced as well as senior researchers in their team.

3. Weaknesses and Threats

The molecular approaches could be more vigorously exploited in the program.

4. Recommendations

Keep on doing the same and introduce novel techniques as they are required.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

The group has a good publication profile (good research published in good places (Nature communications, Ecology letters), thus have internationally competitive research with prolific outputs. The majority of the ideas come from the team.

Declaration on the involvement of students in research

High number of student involvement.

Declaration on societal relevance

They have a good strategy for societal engagement that includes TV and radio presentations, popular journals and newspapers. They also provide expertise and advice to nature conservation, museums.

Declaration on the position in the international and national context

The group has established contacts in leading institutions, including e.g. Harvard, but they do not depend on these collaborations.

Declaration on the vitality and sustainability

Group is clearly very energetic, enthusiastic and productive. Good age profile and sustained grant income.

Declaration on the strategy and plans for the future

Clearly presented future plans and ideas of areas to expand into which are appropriate and likely to be fruitful.

Evaluation of the Team No. 4: Department of Genetic Ecology

1. Introduction

Genetic ecology is a field with expanding opportunities because of the increasing opportunities to link the two topics through molecular biology and population ecology approaches. The department with approximately 8 researchers (12 people; half of them are below 35 years old.) is engaged in a number of individually focused projects where they are clearly able to make valuable contributions. The group focuses on (1) Genomic studies in allopolyploid wheatgrasses, (2) Biogeography and phylogeography, and (3) Microevolutionary processes and phylogeny of closely related plant taxa (with species including wheatgrasses and Triticeae/Hordeae, Chenopodium, Alnus, and Hieraceum).

2. Strengths and Opportunities

The work of this group has agronomic and phylogenetic importance. As one highlight, the questions about divergence of clades in grasses are important and the combination of cytogenetics and whole genome sequencing and use of markers such as FTL open up new ways to look at variation, relationships and introgression. There are opportunities for many collaborations and the programme has a solid foundation.

3. Weaknesses and Threats

Some areas seemed to be addressing questions without having a larger biological framework in mind. Broader collaborations would be helpful for some of the research work, and in a few cases some of the numerical methods for analysis could be strengthened.

4. Recommendations

The biological questions being asked in the research plans presented are important. It would be good to increase their quality profile: some papers could probably be improved by adding more and complementary expertise from additional co-authors and collaborators. It is important to get more ideas and synthesis into the papers beyond the descriptive aspects.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

The group is relatively productive with a range of ‘good’ but not generally outstanding quality of publications in appropriate, well-thought-of, journals (of the ten evaluated, only one is ‘1’, 3 are ‘2’ and 6 are ‘3’). While several of the publications are valuable, this scoring reflects their status since they ultimately do not have the rigour and scale to be the highest grade.

Declaration on the involvement of students in research

Completion of 18 PhDs and current 9 PhD students is excellent. These students clearly get good publications with their involvement, and take advantage of the excellent mentorship of the researchers in the group.

Declaration on societal relevance

The groups have active pedagogical expertise with courses and lectures, are active in supervising students and a number of worthwhile activities in research popularization

Declaration on the position in the international and national context

Good involvement of some collaborations, but additional collaborations in EU and internationally would be valuable.

Declaration on the vitality and sustainability

There are relatively few older researchers, so it is important that future leadership is considered.

Declaration on the strategy and plans for the future

A range of good plans are presented. As noted, it is important that the questions asked, although addressed with detailed work, do have a larger picture of understanding phylogeography and evolution in mind, and provide rigorous underpinning work.

Evaluation of the Team No. 5: Department of Mycorrhizal Symbioses

1.Introduction

The team consists of 12 researchers and some technicians, half of which are below 40 years. The team covers various topics in the field of mycorrhizal symbioses using both experiments in specialized greenhouses in the Institute and also observations in the field. They published their results in many scientific journals, that are recognized internationally in terms of originality and significance. During the last 5 years they increased the citation impact of their publications. Some of their work is applied research and has impact in practice. The team has some collaborative projects with private companies.

2. Strength and Opportunities.

This is an internationally recognized and respected team in the field of mycorhizal symbioses with a broad spectrum of results, that are published in scientific articles. Part of the work deals with applied research and has an impact in practice. The team has a good personnel structure with both experienced researchers at medium age and young researchers or PhD. students. The researchers are engaged in teaching at universities and direct the supervision of PhD students and fellowship- students from abroad.

3. Weaknesses and threats.

The team has several international collaborations, but it should increase efforts to obtain international funding.

4. Recommendations.

The team should aim to increase the quality of their results and publishing them in journal with high IF. They should perform as far as possible experiments in the standardized conditions available in their experimental greenhouse.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition.

The quality of the results is very good.

Declaration on the involvement of students in research.

In the team there are some students in different stage of their study including the PhD and students from abroad.

Declaration on the on societal relevance.

High impact on new knowledge in this field. They cover both basic and applied research with different types of results. They have some collaborative projects with private companies.

Declaration on the position in the international and national context.

The team is well recognized both on national and international level.

Declaration on the vitality and sustainability.

Age structure is good with the equal number of experienced and young researchers.

Declaration on the strategy and plans for the future.

The team have clear strategy and research plan with some new topics in basic research and also the effort to produce innovative products from plant, microbial and animal biomass.

Evaluation of the Team No. 6: Centre for Phycology

1. Introduction

This medium sized group (15) have a very important and useful algal culture facility for applied and fundamental research community. They are recommending and providing these algal cultures for commercial uses, including to a consortium aiming to make biofuels. They use the materials to ask excellent questions of commercial relevance. The group also show excellence in their algal taxonomy, having generated significant works of global importance.

Some of the algal taxonomy and culturing work involves significant international and or commercial collaborations, e.g. their work on polar algae. They have some interesting ecological experiments too, such as carbon partitioning in *Chlorella* from sold crusts found in arid deserts.

2. Strengths and Opportunities

The algal cultures are of global importance, in the reporting period they have identified >40 newly described taxa, cultured >200 stains. About 50% of algal strains have biotechnological potential, they have patented one strain, and developed culture facilities for exploiting microalgae. One lipid hyper-accumulating strain of *Chlorella vulgaris* shows promise. The skills underpinning this productivity demonstrate that the group are well placed into the future to exploit algae commercially.

3. Weaknesses and Threats

The applied research is clearly important, but it is important that the fundamental research and the time to generate monographs is not lost with pressures for the group to make money through commercialising algae.

4. Recommendations

The applied research profile is excellent. They need to liaise strongly with commercial and well-funded international projects across Europe and globally to exploit their skill sets to the full.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition

The most significant publications are the monograph Cyanoprokayota and the Atlas of Diatoms. They also have >130 publications, some of which are in good journals, including e.g. J Appl Phycol, Environmental Microbiology, Biological Invasions, Appl Micorbiol and Biotech). They have 5 papers graded 1 or 2 in quality profile.

Declaration on the involvement of students in research

They are involved in student teaching (Charles University, Masaryk University, University of South Bohemia). One of their students was given a prize by Academy of Sciences of the CR.

Declaration on societal relevance

The research has a strong applied character, with clear societal benefit. They have potential to make significant impact through biofuels and/or other products. The group give training seminars to high school teachers to help them teach about algae to school children. They have some exposure in the media as well (e.g. TV, radio).

Declaration on the position in the international and national context

The algal cultures are very important, they have 923 strains of algae, 712 are available to public and about 300 are dispatched to end-users each year. They have collaborations in Czech republic, e.g. Centre for Polar Ecology, University of South Bohemia, and with the Institute of Plant Physiology and Genetics of the Bulgarian Academy of Sciences.

Declaration on the vitality and sustainability

The work they are doing has every chance to remain vital, productive and sustainable.

Declaration on the strategy and plans for the future

Their research strategy looks sensible.

Evaluation of the Team No. 7: Department of Functional Ecology

1.Introduction

The main worksite of the team is Třeboň but many studies are performed in different destinations world-wide including extreme polar and mountain environments. The team consists of 11 researchers on permanent position and a lot of part-time researchers and postgraduate students. The age structure include many young workers, with most researchers being < 40, 5 from 40 to 60, one >70. The research work is oriented mainly towards functional ecology using various observatory methods and chemical analysis. During the last five years members of the team co-authored a total of 204 scientific articles published in IF journals. Most of them are in

first or second quartile. They also authored 40 chapters in books. Some researchers participate in teaching.

2. Strength and Opportunities.

This is an internationally recognized team in the field of functional ecology with good international collaboration and a good publication activity. This is a large team with 6 experienced researchers, many young researchers, and PhD. students.

3. Weaknesses and threats.

The team is oriented mainly towards field observations and to macroscopic measurements with some chemical analyses; this could be probably be extended to the biochemical or molecular level.

4. Recommendations.

They should make a continuous effort to improve their publication activity so as to increase the IF level. They should try to obtain some international grants.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition.

The quality of the results is very good.

Declaration on the involvement of students in research.

In the team there are a lot of students in different stages of their study including PhD students.

Declaration on the on societal relevance.

High impact of new knowledge in this research field with international recognition and promising application in practice.

Declaration on the position in the international and national context.

The team is well-recognized both nationally and internationally.

Declaration on the vitality and sustainability.

The team need to attract and stabilize younger researcher with a permanent position.

Declaration on the strategy and plans for the future.

The team has a clear strategy and research plan including efforts to use multidisciplinary procedures and in continuing their long-term activities. They should increase their effort to be a member of international grant consortia.

Evaluation of the Team No. 8: Department of Vegetation Ecology

1.Introduction

The scientific activity of Department of Vegetation Ecology is focused on integrative research related to studies of vegetation ecology. Main research topics include i) palaeoecological reconstruction of past vegetation and environment, ii) biodiversity and dynamics of forest vegetation iii) ecology, biogeography and dynamics of wetland vegetation, and iv) national vegetation survey and plant checklists. Vegetation studies cover the past 10,000 years, allowing the determination of the origins and continuity of vegetation types, and then the human impact on distribution

of species and vegetation patterns, and then biodiversity changes in the 20th century. The team consists of 16 scientists and 22 other workers. Scientific level is very high, the team publishes in top journals related to ecology, conservation biology and general biology.

2. Strength and Opportunities.

Original research approach based on understanding patterns in vegetation through time with the special emphasis on human impact. The team is quite young with majority researchers at age 25 -40. They have been very successful in obtaining funds from international and Czech funds. LONGWOOD project is among 13 best projects of “spotlight on European Research Council projects”. Future complex interdisciplinary research is planned, focusing on climatic vs human driving forces in vegetation changes. The research is leading to both national and international baseline data, as well as making excellent and important conclusions from analysis of their data. Clearly there are significant impacts of the work with implications for conservation and policy throughout the world. They are involved with many international collaborations, including large collaboration outputs, and both citations and quality profiles are very good.

3. Weaknesses and threats.

There are few significant weaknesses; perhaps the lowish number of Ph.D. students (only 4).

4. Recommendations.

More Ph.D. students should be attracted. Besides the publications, it would be good to see the group’s impact to be expanded to wider use for scientific advice and recommendations for government agencies. More papers could also be placed in generalist, high profile, scientific journals.

5. Detailed evaluations

Declaration on the quality of the results and share in their acquisition.

The quality of the results is very good and relevant to vegetation ecology.

Declaration on the involvement of students in research.

Number of students involved in the research is very good for bachelor (17) and master (18). However, number of Ph.D. students could be higher, although recruitment, even in this attractive field, may be a challenge. Numerous courses are lectured or co-lectured at major Czech universities.

Declaration on the on societal relevance.

Very high relevance to important issues related to human driving forces in vegetation changes. Good outreach, good activity in knowledge dissemination to the public. It should influence government policies.

Declaration on the position in the international and national context.

The team is well recognized in national context and is recognized on international context, as well. There are some significant links such as ForestREplot, building data for long-term trend analysis. They also prepared the nationally important vegetation surveys.

Declaration on the vitality and sustainability.

Age structure is very good with the majority of young researches. The team activity is well managed.

Declaration on the strategy and plans for the future.

The team has good and realistic research plans for the future.

Evaluation of the Team No. 9: Department of Experimental Phycology and Ecotoxicology

1.Introduction

The team, currently composed of 10 members, focuses on two topics: 1) Autecology of cyanobacteria forming water blooms and 2) Ecotoxicology of nanomaterials and micropollutants. During the evaluation period, they developed efficient technologies to handle cyanobacteria blooms. They also critically assess previous practices in this field.

2.Strengths and Opportunities

The team has strong background in the population biology of cyanobacteria. To improve the quality of aquatic ecosystems, they developed practical methods to reduce cyanotoxins. They have an integrated approach with toxicology and exploited LC-MS to detect cyanobacteria toxins.

3.Weaknesses and Threats

From an FTE and team member discrepancy it appears that many of the researchers are part time. Having staff involved in dispersed activities might provide a threat.

4.Recommendations

Continue working as they are. Consolidate the team with stable full time FTEs

5.Detailed evaluations

Declaration on the quality of the results and share in their acquisition

Stable research output with word leading applications that are fully originated from the team.

Declaration on the involvement of students in research

Good involvement of students at all levels.

Declaration on societal relevance

Extremely relevant and skilled at “transfer of knowledge” to public. One of the example where research carried out makes a large difference in people`s lives.

Declaration on the position in the international and national context

The team is well recognised internationally and provide training for foreign students and scientists

Declaration on the vitality and sustainability

The group is stable and dynamic on an extremely important field of research.

Declaration on the strategy and plans for the future

They have a well developped plan for the future with clear research directions. The plans are clear and the group is well placed to fully implement them.

Date: December 15, 2015

Commission Chair: Emeritus Professor Erick Vandamme