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Executive summary

The present document is a deliverable of the pro-iBiosphere project, funded by the European Commission's Directorate-General Information Society and Media (DG INFSO), under its 7th EU Framework Programme for Research and Technological Development (FP7). Deliverable 1.2.4 – Management report (month 10 to 12), is the fourth report related to this activity. The purpose of the document is to describe the major achievements and difficulties per task, work performed per each partner, provide an indication of the resources spent and justifications, a.o.

One of the objectives of T1.2. "Quality management, assessment and reporting" is to provide a transparent financial management and control of the project. Within this task Quarterly Management Progress Reports will be prepared and submitted to the EU.

All nine deliverables due in the period of June 2013 to August 2013 have been produced according to the original planning.

Workpackage 1: Management and coordination

T1.1 Administrative and financial management (Lead: Naturalis. Start: M1, End: M24)

Staff members updates/changes.

The MfN, RBGK and Plazi have the following changes to report:

- MfN. On August 16 2013, Jana Hoffman left the project due to maternity leave. Since then, Dr. Gregor Hagedorn (Head of Digital World at MfN) and Dr. Daniel Mietchen have assumed responsibilities for Task 3.3 activities and MfN involvement in the project. Daniel has been hired for 6PM, 100% with possibility of extension.
- RBGK is at the initial process of hiring a project assistant to provide support on the various tasks and WP6 activities. The hiring process has been posted online (see [Ref.1](#)).
- Dr. David Patterson has joined Plazi in August 28, 2013. He will participate, together with the former Plazi members, in the development of tasks and activities of the project and provide support in writing reports. His collaboration is planned until the end of the project.

Budget and person months consumption.

An overview of the budget and person months consumed by the consortium is available on Annexes 1 and 2.

T1.2 Quality management, assessment and reporting (Lead: Naturalis. Start: M1, End: M24)

Deliverables. All nine deliverables due in the period of June 2013 to August 2013 have been produced according to the original planning (see [Ref. 2](#)), i.e.:

1. D2.1.1 Report on ongoing biodiversity related projects, current e-infrastructures and standards
2. D1.2.4 Management report 4
3. D2.2 Report on user feedback
4. D2.3 Proof of concept reports on the use of e-tools
5. D2.4.1 Drafts policy on Open Access for data and information (1)
6. D3.2.2 Report on the state and quality of biosystematics documents and survey reports
7. D5.1.2.3 Electronic newsletter 3
8. D5.2.1 Report on dissemination, communication and public awareness (1)
9. D6.3.2 Report on diversity and strengths of existing business plans and discussion of sustainability (2)

Milestones. Two milestones were planned in the period of June 2013 to August 201 (see [Ref. 3](#)), i.e.:

1. MS16 First report on articles and contributions to events (responsible: RBGK)
2. MS20 Meetings with clients/users - benefits (responsible: SIGMA)

MS16 was achieved (see D6.3.2 for the minutes of the meeting).

MS20 was not achieved. Due to the summer vacation period most of the clients/users and task leaders were not available for the meetings. MS20 has been rescheduled by RBGK to the next reporting period. The re-scheduling does not interfere with the WP6 deliverables that need to be submitted in the next months.

pro-iBiosphere May 2013 workshops. In order to evaluate the three workshops organised by pro-iBiosphere on 21-24 of May 2013 (in Berlin) and assess satisfaction by participants, an online questionnaire was distributed among the participants of the workshops. The results and analysis are available on Annex 3.

pro-iBiosphere October 2013 workshops. The FUB-BGBM is the host of the four pro-iBiosphere workshops. The FUB-BGBM is helping with the logistics and will take care of the evaluation questionnaires. Three online meetings have taken place with the various task leaders that are responsible for the workshops. The minutes are available on pro-iBiosphere website internal online library (see [Ref. 4](#); Annex 3).

Online progress meetings. In order to discuss progress of the pilot activities and workshops, various online meetings have been organised within the reporting period. The minutes of these meetings are available on the internal library of the pro-iBiosphere website.

T1.3 Internal Communication (Lead: Plazi; participants: PENSOFT. Start: M1, End: M24)

Online platforms for collaborative work. EU-xpert, Google Drive and the pro-iBiosphere wiki are being used as platforms for collaborative online work among partners. Internal communication between partners is maintained through email exchange, and the pro-iBiosphere website and wiki.

Website. The Internal Communication Platform (ICP) and Internal Document Library (IDL) are primarily being used for sending emails to all partners or pre-defined groups of people, and as a main repository for pro-iBiosphere documents, respectively. At present the IDL contains more than 118 documents. The ICP and IDL can be accessed by the consortium by logging into the website of pro-iBiosphere. The Internal calendar feature of the website is also regularly used as a task manager facilitating the overall project implementation. It is also being used by Naturalis and Sigma to follow up on deadlines and meetings and send automated reminders to the consortium.

Wiki. The wiki is an excellent platform for the exchanging of ideas about the organisations of the workshops, the preparation of agendas and the making of immediate and necessary updates of information. Reports, deliverables and presentation can be accessed through wiki.

T1.4 Consortium and review meetings (Lead: SIGMA; participants: all partners. Start: M1, End: M24)

3rd Consortium Meeting. The meeting took place on Friday the 24th of May 2013 in Berlin. The minutes and action plan of this meeting are available on the pro-iBiosphere wiki (see [Ref. 5](#)).

4th Consortium Meeting. The meeting will be held on Friday the 11th of October 2013 in Berlin. The draft agenda is being prepared by Naturalis & Sigma and will be available in September 2013.

Project review meeting. The review will be held on November 19th 2013 in Brussels. Each project partner will be represented by one participant. A draft agenda has been prepared by Naturalis and shared with the task leaders for feedback. The revised agenda will be submitted to the Project Officer by the first week of September 2013.

Workpackage 2: European and international policy coordination

T2.1 Coordination and routes for cooperation across organisations, projects and e-infrastructures (Lead: Plazi; participants: Naturalis, NBGB, FUB-BGBM, PENSOFT, RBGK. Start: M6, End: M13)

Deliverables. For this task, two reports are envisaged. The first one (due in June 2013), has been submitted to the EC as planned, i.e. D2.1.1 "Report on ongoing biodiversity related projects, current e-infrastructures and standards" and is available on the project wiki for download (see [Ref. 6](#)). The second report D2.1.2 "Draft strategy for increased cooperation" will be submitted in September 2013.

pro-iBiosphere workshop. A workshop on Coordination and routes for cooperation across organisations, projects and e-infrastructures took place on the 23rd of May in Berlin (see [Ref. 7](#)). The workshop was prepared by an online questionnaire form that has been replied by more than 60 participants (see [Ref. 16](#)). The results of the questionnaire were presented at the meeting (see [Ref. 7](#)).

T2.2 Stakeholder requirements (Lead: RBGK; participants: Naturalis, NBGB. Start: M2, End: M12)

The table below presents the status of milestones (MS) 7 and 20, and deliverable (D) D2.2 "Report on user feedback".

MS/D	Due date	Title	Progress	Risks	Likelihood*	Impact*	Mitigation
MS7	May-13	Stakeholder requirements workshop	Workshop well received by participants and consortium, and a large amount of high quality output generated.				
MS20	Aug-13	Follow-up (small) meetings (inc. T6.2)	Follow-up meetings by email and with local contacts and results incorporated into workshop outputs. Face to face meetings with European participants delayed owing to time needed to process workshop outputs and participant availability over the vacation period.	Meetings delayed	H	L	Most results are already incorporated. Any new material can be added as a supplement to the report and or incorporated into tasks 6.1 and 6.2.
D2.2	20 Aug-13	First Draft for circulation to consortium	On schedule.	Delay to circulation	L	H	Prioritise above other lower priority project commitments.
D2.2	Aug 2013	Report on user feedback	On schedule.		M/H	M/H	A minimal contribution to check veracity of data and agreement with findings for publication of report. Subsequent contributions could be appended as a supplement.

*(H=High, M=Moderate and L=Low).

T2.3 State-of-the-art tools to facilitate acquisition of core biodiversity data (Lead: NBGB; participants: Naturalis, Plazi, RBGK, FUB-BGBM. Start: M1, End: M12)

This period was used in writing the report for deliverable of D2.3 "Proof of concept reports on the use of e-tools" (due in August 2013). This involved collating the information gathered since the workshop in Leiden that took place in February 2013. This information was further supplemented by (i) researching the systems and the uses made of information technology by taxonomists (botanists and zoologists); (ii) conducting interviews and discussions with taxonomists on their use of information technology; and (iii) on their attitude and awareness of software systems that have been built for them in the past years. The report will be made available on the wiki in the month of September 2013 (see [Ref. 2](#)).

T2.4 Legal issues of data acquisition, curation and dissemination (Lead: Plazi; participants: all partners. Start: M9, End: M23)

This task consists of a two-step deliverable. Deliverable D2.4.1 consists of a provisional draft policy concerning legal aspects of access to and re-use of data (due in August 2013). This paper will serve as base for discussion within the task and targeted external review and then be developed to a final proposal of a draft policy. The report refers to the conclusions of a workshop in Tempe, Arizona, April 2013, that brought together biologists within interests in names, and legal authorities with special expertise in Intellectual Property Rights, among them a Plazi member. The results of this workshop will be presented in a paper that is to be published in BMC Research Notes. Additionally, the draft document refers to aspects of copyright and database right in the EU and presents examples of transformation of this legal framework in several member states of the EU and the European Economic Area (EEA). This part of the document is based on answers to a questionnaire that has been sent to legal experts in different countries. The number of these examples is still restricted, due to the fact that only few contacted experts have answered to the questionnaire up till now. They will be re-contacted, and the paper will be completed by month 23 (Deliverable 2.4.2).

Workpackage 3: Scientific content and workflow coordination

T3.1 Data acquisition and curation (Lead: Naturalis; participants: NBGB, FUB-BGBM, RBGK. Start: M3, End: M9)

The task finished in month 9 (previous reporting period). The deliverable 3.1 "Towards a Best Practices Guide on editorial policies" (see [Ref. 8](#)) was submitted in May 2013 (M9) and broadly distributed via the social media tools of the project and consortium contacts/networks.

T3.2 Semantic mark-up generation, data quality, and user-participation infrastructure (Lead: Plazi; participants: FUB-BGBM, PENSOFT, Naturalis, RBGK. Start: M3, End: M12)

Deliverables. This task consists of two deliverables:

D3.2.1 Concept paper for involvement of individual experts, commercial vendors, and citizen scientists (see [Ref. 9](#)).

D3.2.2 Report on the state and quality of biosystematics documents and survey reports.

Deliverable 3.2.1 was submitted to the EC in May 2013.

D3.2.2 will be submitted by the end of August 2013 as has been planned. The state and quality of biosystematics documents was assessed and recommendation for future form and content of biosystematics documents were provided. These concerns their description in a semantic web environment including necessary infrastructures like ontologies or reference databases. It includes the feedback from the pro-iBiosphere meetings that took place in Leiden (February 2013) and Berlin (May 2013).

T3.3 Semantic integration of biodiversity literature (Lead: MfN; participants: FUB-BGBM, PENSOFT, Plazi. Start: M1, End: M24)

Deliverable 3.3.1. A Wiki page was set up for collecting relevant information for the upcoming deliverable 3.3.1 "State-of-the-art and research horizons of semantic integration of biodiversity literature" (see [Ref. 11](#)). All partners involved in this Task were invited to provide their input by beginning of July 2013. The BHL-US team, namely Martin Kalfatovic and William Ulate, were asked to provide further feedback to the initial draft of Henning Scholz for the deliverable 3.3.1 (written in December 2012 available on the pro-iBiosphere Wiki page; see [Ref. 11](#)). M. Kalvatovic provided some suggestions for suitable candidates for the planned workshop in T3.3. in February 2014. MfN extracted useful information from the draft report for D3.3.1 and added relevant information.

Changes in staff composition. Responsibilities for the project after the maternity leave of Jana Hoffmann were discussed by the MfN internally. It was decided that Dr. Gregor Hagedorn will take over all responsibilities for pro-iBiosphere at MfN until the end of the project and that a project assistant will be hired to support the Task 3.3 activities and MfN involvement in other tasks of the project. In June 2013, the MfN started the hiring process for a position (6 PM, 100%). The announcement was sent out on the 7th of June 2013. Interviews for the open position were held on the 3rd of July 2013. As a result of this, Dr. Daniel Mietchen has been hired for the project for the next 6 months with possibility of an extension. He is already familiar with the project and actively

contributed to some other tasks in pro-iBiosphere. A hand-over meeting took place on the 15th of August 2013. He will now speed up the progress in preparing the upcoming deliverables and the workshop in February 2014 for Task 3.3.

Workpackage 4: Technical and infrastructure coordination

T4.1 Improve technical cooperation and interoperability at the e-infrastructure level (Lead: FUB-BGBM; participants: Naturalis, PENSOFT, RBGK. Start: M4, End M24)

pro-iBiosphere Meeting 4. The FUB-BGBM was allocated budget to organise the pro-iBiosphere meeting (consisting of four workshops: MS 13, 14, 21 & 22, that will take place on 8th -10th of October 2013), and as such they are taking care of the event logistics. The pro-iBiosphere report on "Ongoing biodiversity related projects" (i.e. D2.1.1., submitted by Plazi in June 2013; see Ref. 6) and feedback received from the participants of "pro-iBiosphere meeting 3" delivered important information for the organisation of meeting 4. Venue facilities, hotel rooms and restaurants have been reserved in advance. Four online meetings have been organised in order to discuss the agendas for the workshops and list of participants. The minutes of these meetings are available in the internal library (see Ref. 4). August 2013, official invitations were sent to envisaged participants. General information on the event, agendas and list of participants are available on the pro-iBiosphere Wiki (see Ref. 12).

Deliverable 4.1. The deliverable 4.1 "Report on strategies for improved cooperation and interoperability between infrastructures" (responsible partner FUB-BGBM) is due in December 2013. Main topic of this report is the service interoperability between taxon-level biodiversity informatics infrastructures, such as taxonomic working platforms (CDM, Scratchpads), taxon treatment repositories (EOL, Plazi, Species-ID) and biodiversity publishers (Pensoft). The report will also assess a pilot implementation for pipelining information from XML-based PLAZI repositories to CDM-stores. The FUB-BGBM will make available a first draft document in August 2013. Results from the (i) pro-iBiosphere May workshop on "Coordination and routes for cooperation", (ii) pro-iBiosphere October workshop on "How to improve technical cooperation and interoperability at the e-infrastructure level", and (iii) the pilot implementations on an "Interoperability model between PLAZI and the EDIT Platform for Cybertaxonomy" will be used as basis of this report.

pro-iBiosphere pilot 3. Within this task a pilot on "Interoperability model between PLAZI and the EDIT Platform for Cybertaxonomy based on transformations between XML-repositories and CDM-stores" is being conducted. Persons leading the pilot are Donat Agosti (Plazi) and Anton Güntsch (FUB-BGBM).

Different institutions use variable technical approaches towards mark-up. The pilot mark-up process on different organism groups (see pilot 1 activities mentioned on T4.2) has provided the opportunity to monitor the mark-up process and set common standards, as well as to identify problems. These will have to be unified at one stage of the workflow. At present most of the treatments are being synchronized to result in the TaxonX output format. TaxonX can then be imported into the CDM to test compatibility. An export to TaxonX will be studied to facilitate the integration of RBGK marked-up data into the EDIT Platform.

All mark-up-pilot leaders (i.e. Bryophytes, *Eupolybothrus*, Spiders, Ants, Fungi, and Nephrolepidaceae) have produced marked-up treatments and uploaded them to the Plazi repository. Until now the following issues and challenges have been encountered:

- The quality of the mark-up varies greatly between the different taxonomic groups and has to be improved. To address the challenge of heterogeneous data quality, the FUB-BGBM compiled a list of minimal quality requirements which should be fulfilled by mark-up documents to be successfully imported (see [Ref. 13](#)).

- GoldenGate (GG) is explicitly loose (i.e., not based on schema or DTD) and allows to mark-up any elements in a text. Users can therefore not be enforced to follow a specific mark-up syntax and structure. Software systems processing GoldenGate output documents have to rely on example structures and informal specifications rather than defined schemas. As a consequence, documents often have to be fed back to the persons conducting the mark-up process in order to correct the data. Data quality checks and validation mechanisms at the GG level could greatly streamline this process and should therefore be considered.
- The GG visualisation of mark-up data is complex and can become an obstacle for less experienced users. An html preview function transforming the mark-up into a more readable web-page would greatly help to speed up the mark-up process and improve its quality.
- Very often, GG does not capture some tags in old literature, and this requires that respective texts are tagged manually. Such cases are, for instance, tags [elevation] and quantity when 'm' (meters) and 'mm' (millimeters) proceed the figures, and tag [species count] when very often the symbols for male and female are used.
- In particular when dealing with long documents, users may lose track of mark-up steps already performed and steps that still need to be performed. A function for monitoring the mark-up process and informing users about what still needs to be done to meet the minimal quality requirements would be helpful.

Because of the above issues and challenges, the alignment and improvement of mark-up outputs into the preferred schema, TaxonX, is taking more time than originally expected. Also the goal to increase time efficiency using a mainly automatic mark-up process has not really been reached. Different approaches to streamlining the mark-up workflows supported by different mark-up editor systems need to be further discussed between mark-up system developers, users, and import software developers. Ideas for a different approach and mark-up issues will be discussed during the upcoming Biodiversity Informatics Horizons 2013 – BIH 2013 (September 2013 in Rome; see [Ref. 14](#)), in online meetings during the next months, and on Monday the 7th of October 2013, in Berlin).

The preliminary results of the pilot will be presented with one posters at the BIH 2013 conference and other international meetings. The poster display has been announced via the pro-iBiosphere Twitter account.

T4.2 Promote and monitor the development and adoption of common mark-up standards and interoperability between schemas literature (Lead: Plazi; participants: Naturalis, FUB-BGBM, PENSOFT, RBGK. Start: M4, End M24)

Pilots. Within this task, the following three pilots are being conducted:

- **Pilot 1.** "Interoperability model between taxon treatments from both legacy and prospective literature from three organismic domains (fungi, plants and animals)". Persons leading the pilot are Lyubomir Penev - Pensoft and Donat Agosti - Plazi."
- **Pilot 2.** "Common query/response model for automated registration of higher plants (International Plant Names Index, IPNI), fungi (Index Fungorum, MycoBank) and animals (ZooBank)". Person leading the pilot is Lyubomir Penev - Pensoft
- **Pilot 4.** "Revision of a tool (CharaParser) that generates identification keys by reusing morphological characters from published species descriptions" Person leading the pilot is Donat Agosti – Plazi

Detailed information on the pilots is available on the pro-iBiosphere wiki (see [Ref. 10](#)).

Pilot 1 aims at getting the content out of the published record in a form that can be re-used in the present (and increasingly) Cybertaxonomy environment. All mark-up-pilot leaders for Bryophytes, Eupolybothrus, Spiders, Ants, Fungi, and Nephrolepidaceae have produced marked-up treatments and uploaded them to the Plazi repository. All pilots were able to produce a target document. With the exception of the Loranthaceae, all mark-up pilots used GoldenGate to carry out semantic mark-up. The results of these pilots is briefly described below.

- The centipede genus *Eupolybothrus* (Lithobiidae, Chilopoda) comprises ca. 35 species, and several new species as revealed by the recent molecular analysis based on Cytochrome C Oxidase Subunit I gene (COI) barcoding. They occur in the Mediterranean realm (South Europe, North Africa, Near East). This taxon was used to exemplify the Pensoft's Mark-up and Taxon profile tools in 2010. Within the pilot, a total of 21 taxon treatments have hitherto been uploaded to the Plazi platform. By mid-September 2013, we envisage to have all original description treatments for the species of *Eupolybothrus* and all treatments for the *Eupolybothrus Caesar* group marked-up and uploaded on Plazi. A publication based on the pilot is being scheduled in the Biodiversity Data Journal. The publication will demonstrate for the first time an enhanced Cybertaxonomy checklist accompanying the description of a new species.
- Spiders. The idea of this pilot is to demonstrate a two-pronged approach to dealing with the massive challenge of populating a taxonomic scaffolding (represented by the World Spider Catalog) with treatments. The first part is to mark-up taxonomic articles where they are concentrated. To represent this, we have marked-up all the open access spider articles in Zootaxa. The second part is to have specialists mark-up the remaining articles relevant to a particular taxonomic domain. One of the open access articles in Zootaxa deals with the spider family Penestomidae. A handful of other papers have contributed treatments on Penestomid species, and these have now been added.
- *Loranthaceae* have started to transform existing mark-ups into TaxonX. For this pilot we have been concentrating on the feasibility of fine grained atomisation of geographical and morphological information, both of which rank high in the feedback from the user requirements workshop (May 2013), and the mark-up of identification keys.. A schema for mark-up of the morphological descriptions and the detailed geographical distribution have been developed and applied to existing marked-up text for *Helixanthera* (from three publications Flora of Tropical East Africa, Mistletoes of Africa, Flora Malesiana) and *de novo* to the account for *Helixanthera* from the Flora of China. The existing mark-up was produced using the "Kew method" or derivations of it, the Flora of China account was done using a combination of GoldenGate with the other methods. It is apparent that different methods have their strengths and weaknesses for different stages of the mark-up process. Where possible, time budgets for different stages of the mark-up for the different methods have been recorded, so it should be possible to get comparative ballpark estimates of the time required to mark-up elements such as treatment boundaries for example (a pro-forma spreadsheet was set up online for this purpose at the beginning of the pilots).
- The *Chenopodium* pilot concentrated on two aspects of the mobilization of legacy literature, i.e.: (i), assessing the value of the legacy literature as a source of distributional records, and (ii) assessing the ease of workflow from paper to the EDIT Common Data Model database. Seventeen different texts containing 127 treatments of *Chenopodium* species were marked-up using the GoldenGate editor. These texts are a broad cross-section of the taxonomic literature spanning the 19th, 20th and 21st centuries. These text were mostly written in English, but several other languages were included that are also written in Latin script. These treatments were converted to digital text in various ways, including commercial OCR systems, crowd sourced transcription (Wikisource) and manual transcription. During the process details of difficulties

were documented and some improvements to the GoldenGate editor were made. Completed texts were deposited in the Plazi repository, from where they were uploaded into the CDM store, but not before mark-up errors and inconsistencies had been resolved. Resolving errors involved a certain amount of iteration between editing in GoldenGate and the CDM upload scripts. As a parallel activity we have gathered localised records of one species of *Chenopodium* from as many different sources as possible, such as databases, legacy literature and herbaria. These data will be used to assess the value of botanical literature as a source for biogeographical information.

- Nephrolepidaceae A published account of the Nephrolepidaceae (Hovenkamp & Miyamoto, 2005) was marked-up using the GoldenGate (GG) editor, and has been deposited in the Plazi repository. During the mark-up process, there has been intensive contact with the developer of GG, and as a result, various updates of GG were installed during the update process. This is probably the reason that the level of detail of mark-up is at present very uneven throughout the document, and additional mark-up is necessary. As the GoldenGate automated pipelines do not allow this, this is much more time-consuming, and is a task for the coming months.
- Fungi. Mycorrhizal fungi play a central role in the functioning of terrestrial arctic ecosystems, providing minerals and water to arctic plants in nutrient-poor environments and harsh climates. Ectomycorrhiza (ECM) is the predominant mycorrhiza type in arctic and alpine environments. ECM fungi are crucial for the survival of arctic shrubs (e.g. *Betula*, *Dryas*, *Salix*). The goal of the fungi pilot is to provide tools that will facilitate taxonomic work by making comparisons of morphological and ecological data more efficient. For this purpose, we have focused on the mark-up of the taxonomic literature of arctic ECM *Lactarius* species. This genus works well as a study case, because of the manageable number of arctic species (ca. 20) and available monographs. Moreover, we have recently detected 2-3 putatively new species lineages in the Arctic using molecular phylogenetics and these can serve as a test case for the above comparisons. We are finishing up the scanning and the mark-up of the selected literature using GoldenGate editor. Validation and quality check of data integrity are still required before depositing the data in the Plazi repository. The next step is to implement character parsing tools to utilize the deposited dataset to facilitate morphological comparison of the taxa of focus.
- Bryophytes. The genus *Campylopus* comprises a total of 13 species occurring in the Guianas region (Guyana, Surinam, French Guiana). The genus was recently treated in the Flora of the Guianas (Series C, fascicle 2, year 2011) but some species descriptions can only be found in the Flora of Suriname (vol. VL, part 1, Musci I and II, year 1964). The pilot focuses on marking-up descriptions that are either available only as hard copy or no longer available. Various text files were scanned and marked-up using GoldenGate editor. Upon completion of mark-up activities in June 2013, the treatments were uploaded on Plazi. A second upload was required to due omission of the metadata associated. At present Plazi and the FUB-BGBM are solving a few technical issues to allow the pipeline between Plazi and CDM.

In order to simplify the mark-up with GG for users and have a set common standards, a mark-up requirements list was posted online (see [Ref. 27](#)). At present the agreed mark-up standards refer to:

- **nomenclature:** scientific name, author and nomenclatural reference – the latter at least roughly marked as a bibref or a citation.
- **material_citations:** (i.e. specimens, observations, types): locality and observation/collecting event details
- **description / supplemental taxon data:** diagnosis (for technical reasons here and not under descriptive data), biology_ecology, scientific name - the CDM cannot handle taxa from a descriptive part yet, it is handled as a normal string content.

- **distribution:** a summary of the distribution based also on the data given in detail in the material_citations as string.
- **references:** bibliographic references; as string.
- **descriptive data:** at present only with very low granularity. The data cannot be marked-up in TaxonX, but can be inserted as SDD, or referred to as auxiliary material. We have started communicating with the developer of CharaParser software.
- **polytomous keys** are also important elements that cannot be precisely marked-up with TaxonX yet but are accommodated in the CDM. **treatment:** a block of text that is explicitly linked to a particular taxon. This taxon is defined in the nomenclature section of the treatment. A treatment will be given a unique identifier.
- **citation:** a reference to a treatment.
- Developing a mark-up quality checker function is being discussed.

These agreed elements can also be mapped to the elements of the TaxonX schema (see [Ref. 28](#)).

Pilot 2 on the “Electronic registers for species information (IPNI, Index Fungorum, MycoBank, ZooBank)”, has been successfully tested in beta by a server-to-server query model established between IPNI and PhytoKeys. The pilot is illustrated by a new genus *Lettowia* description and new combination *Lettowia nyassae* (Oliv.) H. Rob., in the paper of Harold Robinson and John J. Skvarla (2013; see [Ref. 15](#)).

Pilot 4 aims to revise a tool (CharaParser) that generates identification keys by reusing morphological characters, locality and bibliographic citations. In order to do so, a comparison of the character parsing techniques will be made. The current workflow includes:

- Treatments from legacy literature marked-up to morphological characters, locality and bibliographic citations.
- Review of other data types (e.g. phylogenies, ecological data) along with other ongoing initiative projects.
- Key generation functions in the CDM Single-access keys.
- Multi-access keys.
- Highly Structured descriptive data.

A description of the use of CharaParser is planned using ants data and information. The ant pilot focuses on the extraction of treatments from the legacy publications covering the ant genus *Anochetus* in Madagascar, including publications that has been cited in the last revision by Fisher & Smith, 2009. Character and character state data will be extracted using CharaParser tool. The characters will be uploaded to the Hymenoptera Name Server. The characters matrix will then be updated with data from a couple of new *Anochetus* taxa. A new publication will be created to describe a couple of new taxa using the existing tools at the Hymenoptera Name Server, exporting the publication in Taxpub DTD, including links to the names, bibliographic references, materials observed and treatments. It will be also explored how morphological characters could be marked-up and linked to the character matrix in HNS.

The preliminary results of Pilots 1-3 will be presented with three posters at the BIH 2013 conference and other international meetings.

Workpackage 5: Dissemination, communication and public awareness

T5.1 Development of the project image, documentation and external communication web platform (Lead: PENSOFT; participants: SIGMA, Plazi. Start: M1, End M24)

Website and wiki. During this reporting period, both the website and wiki have been updated in real time with information on the project activities and its partnership. In the last three months (i.e. May-July 2013), the pro-iBiosphere website has got 17.608 page loads and altogether 4.416 visitors, of which 1.721 were first time visitors and 2.695 returning visitors. Towards the end of the period, the most visited pages were: Homepage (9150 page view), News (1860 p.v.), Partners (666 p.v.), the Project (478 p.v.), Workpackages (442 p.v.) and Events (368 p.v.). 20 news were published in the last three months. The website has been visited from 89 countries, main traffic comes from Germany (942 visits), Bulgaria (754 v.), United Kingdom (418 v.), Netherlands (323 v.) and France (299 v.). The website was visited via social media 76 times. The Facebook page of project had 88 friends, Twitter 107 followers, LinkedIn 62 members and Google+ 25 followers.

Documents templates. To correspond to the policy of pro-iBiosphere that encourages open access all partners agreed to update the disclaimer of deliverables. The deliverable template was updated by including the terms of the Creative Commons Attribution License 3.0 (CC-BY), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Registration and questionnaires for meetings. In order to facilitate registration and evaluation of the pro-iBiosphere meetings by participants, an online registration template and online questionnaire (see [Ref. 16](#)) is available on the website of the project.

Presentations. All presentations given during the pro-iBiosphere workshops that have been organised so far are available for download on the project wiki (see [Ref. 17](#)).

T5.2 Dissemination of the project results through outreach activities (Lead: SIGMA; participants: all partners. Start: M3, End M24)

Deliverables. Deliverable 5.2.1 will be submitted to the EC in the last week of August 2013. The report contains partners contributions to events, publications and a calendar of contributions for the next project period, a.o. The deliverable is available on the internal page of project wiki (see [Ref. 18](#)).

Dissemination database. The dissemination database containing all project contacts was updated with the new workshop contacts as a result of the pro-iBiosphere workshops that took place in May 2013 in Berlin. At present the database contains 350 contacts made up of partners' contacts and participants to the project meetings.

Project eNewsletter. The third pro-iBiosphere newsletter (see [Ref. 19](#)) will be released by the end of August (M12) and disseminated broadly pro-iBiosphere stakeholders using the updated dissemination database.

Google Calendar. A Skype meeting was organised in M10 between Sigma and Naturalis to discuss the Google Calendar functionalities, usage and to investigate how to share the content of the event calendar with partners so that they could follow up their project activities on their personal calendar and create corresponding news on the website and on social media. In M10 a calendar file was shared with all partners. The file allows partners to integrate the project calendar directly into their own calendar (on their computer or on Google Calendar).

Social Media. Further efforts to promote the project Social Media while attracting more members have also been pursued by the project: a promotional email was sent to all partners to promote the project's Social Media groups/pages to their contacts. The two account managers (i.e., Sigma and Naturalis) ensured new discussions and content were made available on a regular basis with the contribution from all partners within this period. Dissemination information on how to get in touch with the pro-iBiosphere project through social media was forwarded by the MfN to their staff, the German Systematic Association (GfBS) and the German Young Systematists (JuSyS).

Poster. A poster template has been drafted jointly by Sigma and Pensoft. The template will be used by project partners to present the project results in various international events (e.g., Biodiversity Informatics Horizons conference to be held on September 3-6, 2013 in Rome, Italy; TDWG meeting to be held on 28 October - 1 November 2013, in Florence, Italy; a.o.).

Contribution to events ICT2013. In May 2013 the pro-iBiosphere consortium in collaboration with the e-ScienceTalk project (in charge of the coordination of the support action of the e-Infrastructure Unit; see [Ref. 20](#)) and other e-infrastructure projects, drafted a proposal for the ICT 2013 call for networking sessions and exhibition booths (i.e. event organised by the European Commission's DG CONNECT to be held from November 6 to 8, 2013 in Vilnius, Lithuania). The proposal was submitted to the networking theme "What does the future hold for e-science and big data?". The team also applied for an exhibition stand on "e-Infrastructures at work and the future of research". Both, the proposal and exhibition booth have been approved by the EC. pro-iBiosphere representation during the meeting is being discussed within the consortium. At present, the agenda and list of potential speakers are being discussed between the different e-Infrastructure initiatives involved and further developments are expected for the next reporting period.

In July 2013 pro-iBiosphere participated in the "Open Access" event organised by the European Commission in Brussels (see [Ref. 25](#)). As a result of this, an Open Access statement from the pro-iBiosphere consortium was submitted to the EC. The statement is available on the project website (see [Ref. 26](#)).

MS16 - First report on articles and contributions to events. This report, detailing partners' contributions to events and publications along with a calendar of contributions for the next project period was prepared in M11 by Sigma Orionis and is being updated by partners on a regular basis. The report will be part of Deliverable D5.2.1 (due in M12).

T5.3 Stakeholder engagement and communication (lead: SIGMA, participants: all partners. Start: M18, End M22)

The task starts in M18. No activities to be reported for this period.

Workpackage 6: Sustainability planning

T6.1 Measuring and Constraining the costs of delivering services (lead: Naturalis; participants: FUB-BGBM, PENSOFT, RBGK, Plazi. Start: M6, End M21)

Task 6.1 deals with documenting where do costs arise in the workflows of Biota producers and service providers. On the 22nd of May 2013 (in Berlin), a workshop on “Measuring and constraining the costs of delivering Biota information and services” was organised. A total of 50 persons participated in the workshop. For detailed list of participants see [Ref. 21](#). The purpose of the workshop was to: (i) understand what costs are involved in providing Biota information and services, (ii) how to measure the baseline costs for comparison with new business models; and (ii) to document approaches to sustainability within the wider biodiversity information community,

During the past months all the data and information obtained from the workshop is being processed and consolidated. The results of the workshop will provide a solid basis on which to build the final report (due November 2013).

T6.2 Identifying and measuring the benefits of delivering services (Lead: RBGK; participants: Naturalis, FUB-BGBM, PENSOFT, NBGB, Plazi. Start: M7, End: M18)

The table below presents the status of milestone (MS) 21.

MS/D	Due date	Title	Progress	Risks	Likelihood	Impact	Mitigation
MS21		Workshop planning	List of 17 non-project participants for workshops 3 and 4 drawn up in conjunction with SIGMA (following 1 day face to face planning meeting in Nice for T6.3). Participants have been contacted and replies have been received. Our meeting clashes with the GBIF meeting and it is also close enough to World Flora online meeting to put-off some non-EU candidates. 4 of the invitees are non-EU and will require funding.	Key participants are unable to attend owing to timetable.	M	H	Target available funding on key participants. Accept a narrower range of representation and scope of the report, and seek more participants from within partner organisations.
MS21		Recruitment	Closing date for applications for post of project assistant (RBGK) 29th Aug. Interviews 19th Sep.	Post not filled in time to assist with the October workshop.	L	L	Project partners to assist as facilitators.

Likelihood/impact H= high M=medium L=low

T6.3 Evaluating business models currently in use by partners (Lead: SIGMA; participants: all partners. Start: M2, End M21)

In June (M10) an online meeting was organised between Sigma and RBGK, to discuss the preparations for the office meeting in Sophia Antipolis, France; the minutes of this meeting are available on pro-iBiosphere wiki page on an internal page (see [Ref. 22](#)). On July 4 2013 (M11) Sigma welcomed RBGK in their offices to discuss (i) Task 6.3 activities, (ii) the release of the Deliverable D6.3.2, and (iii) the organisation of the “Meeting to evaluate business models currently in use by partners and relevant non-partners” (MS22) to be held on October 10, 2013 in Berlin. Following this meeting, a revised work plan for Task 6.3 has been prepared (see [Ref 23](#)). A tentative agenda and list of participants for the workshop is available on the wiki (see [Ref. 24](#)). External participants have been invited by RBGK in July 2013.

New tables have been created and shared on the wiki with project partners to gather their inputs on exploitation plans and business models (see [Ref. 22](#)).

Further developments will be reported in the next reporting period with the organisation of MS22 (e.g., final agenda, participants, event outcomes).

T6.4 Towards Sustainability for Services (Lead: RBGK, participants: Naturalis. Start: M15, End M24)

The task starts in M15. No activities to be reported for this period.

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Annex 1. Overview of budget

Table 1. Description of consumed costs per partner (period: 01 June to 31 August 2013)

Partner 1. Naturalis

Partner 1. Naturalis			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	26.128,24	
	Indirect costs	1.828,97	7% reimbursement rate x personnel costs.
WP1	Other direct costs	1.019,08	Travel and subsistence meeting Berlin 20-24 May 2013 Eva/Soraya
WP1	Other direct costs	250,48	Travel costs meeting Rome 2-7 Sept 2013 Soraya
WP1	Other direct costs	395,76	Travel costs meeting Berlin 8-11 Oct 2013 Eva/Soraya
WP1	Other direct costs	639,50	EU-Fin
WP6		639,50	EU-Xpert year 2
WP6			
WP2-WP6	Indirect costs	206,10	7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		95.044,86	
Subtotal used during June 2013 to August 2013		31.107,63	
Total used		126.152,49	
Percentage of contribution used		57.86%	
Requested EU contribution		218.048,00	

Partner 2. NBGB

Partner 2. NBGB			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	6691,45	
	Indirect costs	468,40	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6			
WP2-WP6	Indirect costs		7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		30.562,98	
Subtotal used during June – August 2013		7.159,85	
Total used		37.722,83	
Percentage of contribution used		61,77%	
Requested EU contribution		61.067,00	

Partner 3. FUB-BGBM

Partner 3. FUB-BGBM			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	16.006,00	WP 1: 0.06 PM, WP 2: 0.03 PM, WP 3: 1.31 PM, WP 4: 1.88 PM, WP 5: 0,04 PM
	Indirect costs	1.120,42	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6			
WP2-WP6	Indirect costs		7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		37.953,80	
Subtotal used during June – August 2013		17.126,42	
Total used		55.080,22	
Percentage of contribution used		28,79%	
Requested EU contribution		191.314,00	

Partner 4. Pensoft

Partner 4. Pensoft			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	5.240,77	1.35 PMs for 2 researchers, 2 developers, 1 mark-up expert, 1 project manager
	Indirect costs	366,85	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs	485,73	Printing of pro-iBiosphere leaflet
WP6			
WP2-WP6	Indirect costs	34,00	7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		54.045,21	
Subtotal used during June – August 2013		6.127,35	
Total used		60.172,56	
Percentage of contribution used		50,66%	
Requested EU contribution		118.768,00	

Partner 5. SIGMA

Partner 5. SIGMA			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	12.070,00	Labour costs in line with activities detailed in the progress report
	Indirect costs	844,90	7% reimbursement rate x personnel costs.
WP1	Other direct costs		
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6	Other direct costs	150,00	Expenses related to the hosting of the office meeting between RBGK and Sigma held on July 4 in Sophia.
WP1-WP6	Indirect costs	10,50	7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		43.832,78	
Subtotal used during June – August 2013		13.075,40	
Total used		56.908,18	
Percentage of contribution used		35,82%	
Requested EU contribution		158.851,00	

Partner 6. RBGK

Partner 6. RBGK			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	13.221,16	
	Indirect costs	925,50	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6		1.800,00	
WP2-WP6	Indirect costs	126,00	7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		67.932,80	
Subtotal used during June – August 2013		16.073,00	
Total used		84.005,00	
Percentage of contribution used		54%	
Requested EU contribution		156.008,00	

Partner 7. Plazi

Partner 7. Plazi			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	17.346,00	Labour costs in line with to detailed in progress report, including two deliverables
	Indirect costs	1.214,00	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6			
WP2-WP6	Indirect costs		7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		111.428,00	
Subtotal used during June – August 2013		18.560,00	
Total used		129.988,00	
Percentage of contribution used		62%	
Requested EU contribution		209.860,00	

Partner 8. MfN

Partner 8. MfN			
Work Package	Item description	Amount (€)	Explanations
WP1-WP6	Personnel costs	471,97	0.125 PMs for Jana Hoffmann in charge of coordinating management activities in WP 1 (report preparation, coordination of tasks lead by MfN)
		2.566,60	0.50 PMs for Jana Hoffmann as related with activities for T3.3 (WP3) as stated in the progress report.
	Indirect costs	212,69	7% reimbursement rate x personnel costs.
WP2	Other direct costs		
WP3	Other direct costs		
WP4	Other direct costs		
WP5	Other direct costs		
WP6			
WP2-WP6	Indirect costs		7% reimbursement rate x total direct costs.
Subtotal used during Sept 2012 – May 2013		8.852,75	
Subtotal used during June– August 2013		3.251,26	
Total used		12.104,01	
Percentage of contribution used		18,34%	
Requested EU contribution		65.996,00	

Annex 2. Overview of person months consumed

Table 2. Description of person months consumed per partner (period: 01 June to 31 August 2013)

Partner 1. Naturalis

Work Package	WP1			WP2				WP3		WP4		WP5			WP6			
Task	T1.1	T1.2	T1.4	T2.1	T2.2	T2.3	T2.4	T3.1	T3.2	T4.1	T4.2	T5.1	T5.2	T5.3	T6.1	T6.2	T6.3	T6.4
Contractual PM (whole project period)	2.75	2.75	0.5	1.0	0.5	0.5	0.25	4.0	1.0	1.5	1.5	0.2	0.25	0.5	6	1	1	1
Subtotal used period Sept 2012 - May 2013	2.47	0.73	0.13	1.12	0.67	0.66	-	1.67	0.47	0.1	0.1	0.42	0.4	-	1.13	0.1	0.06	-
Subtotal used during period June - August 2013	0.76	1.27	0.33	-0.98	-0.47	-	-	0.85	-	0.01	0.05	0.1	0.06	0.24	2.25	0.06	0.08	-
Total used	3.23	2	0.46	0.14	0.2	0.66	-	2.52	0.47	0.11	0.15	0.52	0.46	0.24	2.38	0.16	0.14	-

Partner 2. NBGB

Work Package	WP1	WP2				WP3	WP5		WP6
Task	T1.4	T2.1	T2.2	T2.3	T2.4	T3.1	T5.2	T5.3	T6.3
Contractual PM (whole project period)	0.5	0.5	0.5	4	0.25	0.5	0.25	0.5	1.0
Subtotal used during period Sept 2012 - May 2013	0.225	0	0	3.9	0	0.15	0	0.15	0.075
Subtotal used during period June - August 2013	0.825	0	0	1.05	0	0	0	0.3675	0
Total used	1.05	0	0	4.95	0	0.15	0	0.5175	0.075

Partner 3. FUB-BGBM

Work Package	WP1		WP2		WP3			WP4		WP5		WP6		
Task	T1.4	T2.1	T2.4	T3.1	T3.2	T3.3	T4.1	T4.2	T5.2	T5.3	T6.1	T6.2	T6.3	
Contractual PM (whole project period)	0.5	0.5	0.25	4	4	3	6	2	0.25	0.5	1	1	1	
Subtotal used during period Sept 2012 - May 2013	0.50	0.28		4.36			4.72		0.11		0			
Subtotal used during period June - August 2013	0.06	0.03		1.31			1.88		0.04					
Total used	0.56	0.31		5.67			6.60		0.15					

Partner 4. Pensoft

Work Package	WP1		WP2		WP3		WP4		WP5			WP6		
Task	T1.3	T1.4	T2.1	T2.4	T3.2	T3.3	T4.1	T4.2	T5.1	T5.2	T5.3	T6.1	T6.2	T6.3
Contractual PM (whole project period)	1	0.5	2.5	0.25	0.5	2.5	4	3	5	0.25	0.5	1	1	1
Subtotal used during period Sept 2012 - May 2013	0.84	0.29	0.94	0.1	0.05	0.76	1.23	1.05	4.51	0.16	0.15			0.10
Subtotal used during period June - August 2013	0	0.05	0.20	0	0	0.30	0.30	0.40	0.1	0	0	0	0	0
Total used	0.84	0.34	1.14	0.1	0.05	1.06	1.53	1.45	4.61	0.16	0.15	0	0	0.10

Partner 5. SIGMA

Work Package	WP1	WP5			WP6
<i>Task</i>	<i>T1.4</i>	<i>T5.1</i>	<i>T5.2</i>	<i>T5.3</i>	<i>T6.3</i>
Contractual PM (whole project period)	1.5	2	2	4	3.5
Subtotal used during period Sept 2012 - May 2013	0.8	2.0	0.7	0	1.7
Subtotal used during period June - August 2013	0.1	0	0.5	0	1.1
Total used	0.9	2	1.2	0	2.8

Partner 6. RBGK

Work Package	WP1		WP2			WP3		WP4		WP5		WP6			
<i>Task</i>	<i>T1.4</i>	<i>T2.1</i>	<i>T2.2</i>	<i>T2.3</i>	<i>T2.4</i>	<i>T3.1</i>	<i>T3.2</i>	<i>T4.1</i>	<i>T4.2</i>	<i>T5.2</i>	<i>T5.3</i>	<i>T6.1</i>	<i>T6.2</i>	<i>T6.3</i>	<i>T6.4</i>
Contractual PM (whole project period)	0.5	0.25	3.0	0.25	0.25	0.5	0.5	1.0	1.0	0.25	0.5	1.0	6.0	1.0	6.0
Subtotal used during period Sept 2012 - May 2013	0.4	1.63	1.54	0.06	0	0.65	0.06	0.45	0	0	0	1	0.25	0	0.75
Subtotal used during period June - August 2013	0	0	1.46	0	0.05	0	0	0	0.5	0	0	0	0.05	0.4	0
Total used	0.4	1.63	3.0	0.06	0.05	0.65	0.06	0.45	0.5	0	0	1	0.3	0.4	0.75

Partner 7. Plazi

Work Package	WP1		WP2		WP3		WP4	WP5			WP6		
Task	T1.3	T1.4	T2.1	T2.4	T3.2	T3.3	T4.2	T5.1	T5.2	T5.3	T6.1	T6.2	T6.3
Contractual PM (whole project period)	3	0.5	2,5	2	3	1	3	3	0.3	0.5	1	1	1
Subtotal used during period Sept 2012 - May 2013	0.6	0.9	1.8	2.6	2.3	0.4	2.7	0.3	0.1	0	0.1	0	0.1
Subtotal used during period June – August 2013	0.03	0	0	0.6	0.5	0.1	1.5	0.1	0.04	0	0.03	0	0.01
Total used	0.63	0.9	1.8	3.2	2.8	0.5	4.2	0.4	0.14	0	0.13	0	0.11

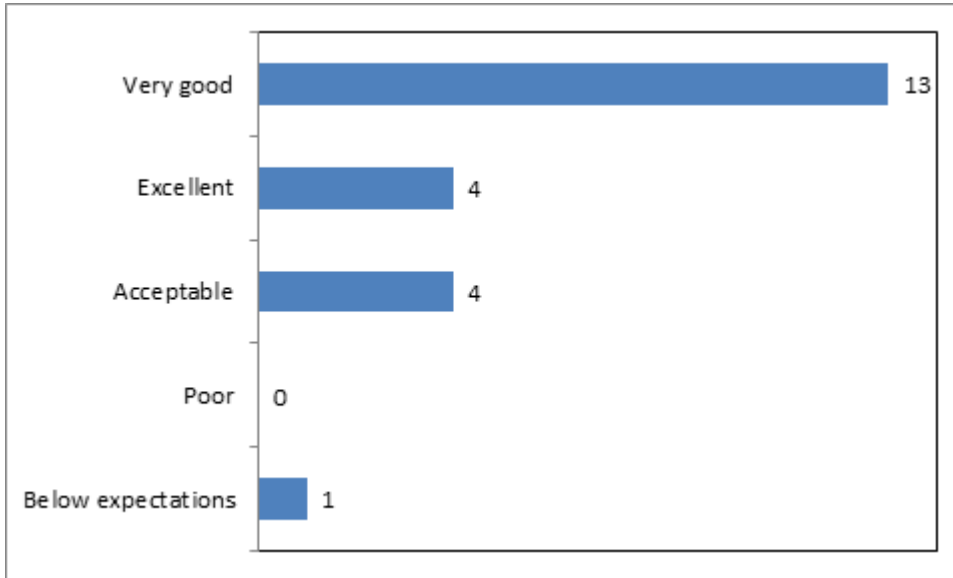
Partner 8. MfN

Work Package	WP1	WP2		WP	WP5		WP6
Task	T1.4	T2.1	T2.4	T3.3	T5.2	T5.3	T6.3
Contractual PM (whole project period)	0.5	0.5	0.25	5.0	0.25	0.5	1.0
Subtotal used during period Sept 2012 – May 2013				0.95	0.02		
Subtotal used during period June - August 2013	0.125			0.50			
Total used	0.125			1.45	0.02		

Annex 3

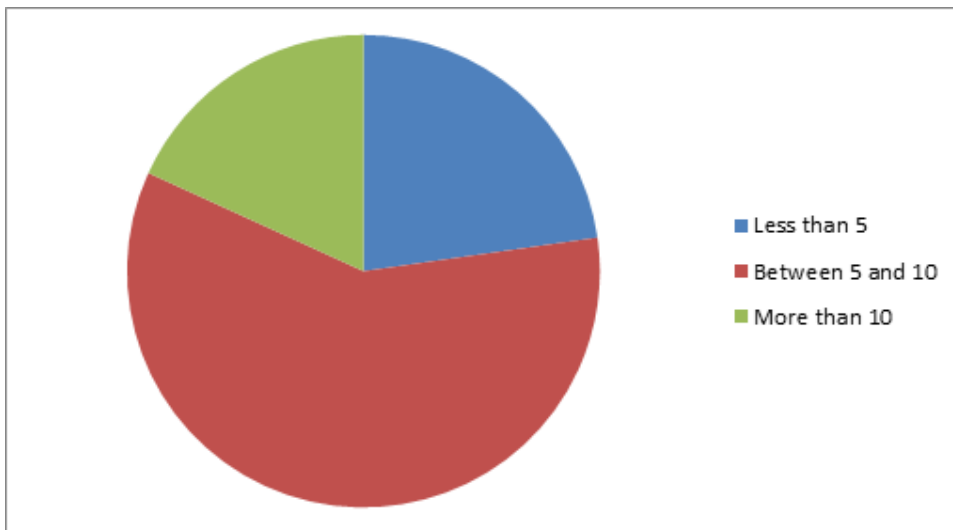
Results & Analysis of Meeting 3 (May 2013 - in Berlin):

How do you rate the content of the event?



All participants found the meeting either quite or very interesting and would recommend these events to others.

How many useful contacts have you established or strengthened during the event?



Testimonials

- Excellent meeting with good formal discussions and excellent chats over breakfast. Not only useful, but enjoyable. – Henry Ford – Ecoflora of the British Isles, Bath University

- It was a very well thought workshop, and the first day was a great way to connect with people. Everybody seems to be very engaged in the project and topics and I found it an extremely welcoming environment. – Sonia Dias – Bioversity International, Rome
- I really enjoyed the morning workshop sessions and think that the results from these morning sessions have great potential for helping shape how we best carry out biodiversity research in the future and reach our users most effectively. – Anonymous