

Webinar

Preparing an application for a Marie Curie post-doctoral fellowship



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TROPIBIO

TAXON-TIME



United Nations
Educational, Scientific and
Cultural Organization



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University of Porto
Porto, Portugal



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DE CIENCIA
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How to turn your research idea into a 10-page proposal

Juliana Stropp

19/07/2021

1. What is the MSCA-PF fellowship?

- Post-doctoral fellowship funded by the European Commission
- Strong component on training
- Call opened 22 June 2021
- Call closes 12 October 2021

<https://ec.europa.eu/research/mariecurieactions/calls/msca-postdoctoral-fellowships-2021>



About MSCA ▾ Actions ▾ **Funding** Jobs Resources ▾ What's new ▾

MSCA Postdoctoral Fellowships 2021

Reference [HORIZON-MSCA-2021-PF-01](#)
Deadline **12 Oct 2021**

MSCA Postdoctoral Fellowships enhance the creative and innovative potential of researchers holding a PhD and who wish to acquire new skills through advanced training, international, interdisciplinary and inter-sectoral mobility. MSCA Postdoctoral Fellowships will be open to excellent researchers of any nationality.

The scheme also encourages researchers to work on research and innovation projects in the non-academic sector and is open to researchers wishing to reintegrate in Europe, to those who are displaced by conflict, as well as to researchers with high potential who are seeking to restart their careers in research.

Follow this link to learn more details about [MSCA Postdoctoral Fellowships](#) .

Fellowships will be provided to excellent researchers. undertaking international mobility either to or

2. Getting started

- Define topic and main ideas
- Download form
- Contact potential supervisor and host institution

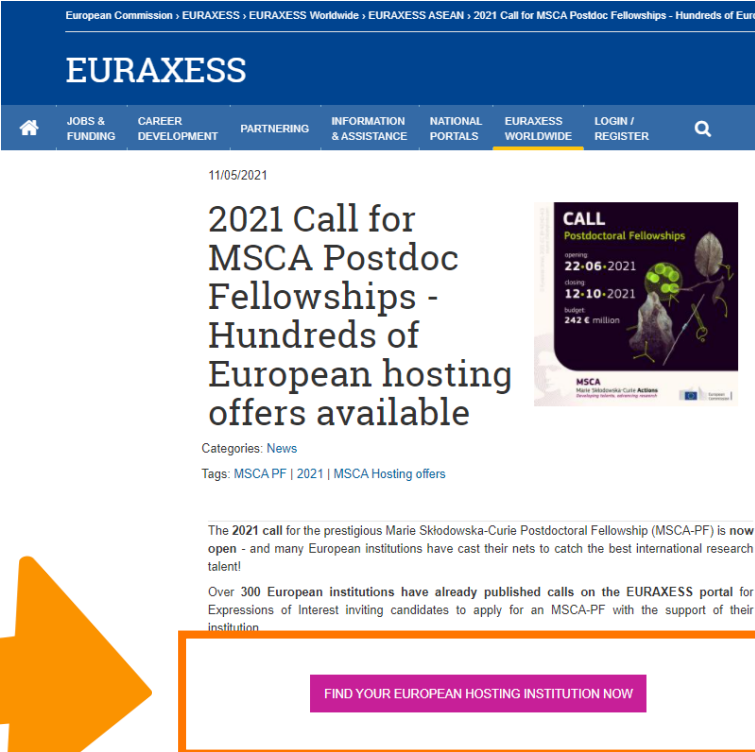
Over 300 institutions

Info and form at:

<https://ec.europa.eu/research/mariecurieactions/calls/msca-postdoctoral-fellowships-2021>

Search host institution at:

<https://euraxess.ec.europa.eu/>



The screenshot shows the EURAXESS website interface. At the top, there is a navigation bar with the EURAXESS logo and several menu items: HOME, JOBS & FUNDING, CAREER DEVELOPMENT, PARTNERING, INFORMATION & ASSISTANCE, NATIONAL PORTALS, EURAXESS WORLDWIDE (highlighted), and LOGIN / REGISTER. Below the navigation bar, the date 11/05/2021 is displayed. The main content area features a news article titled "2021 Call for MSCA Postdoc Fellowships - Hundreds of European hosting offers available". To the right of the article is a graphic with the text "CALL Postdoctoral Fellowships" and dates "opening 22-06-2021" and "closing 12-10-2021", along with a budget of "242 € million". Below the article title, it says "Categories: News" and "Tags: MSCA PF | 2021 | MSCA Hosting offers". The article text begins with "The 2021 call for the prestigious Marie Skłodowska-Curie Postdoctoral Fellowship (MSCA-PF) is now open - and many European institutions have cast their nets to catch the best international research talent!". It continues with "Over 300 European institutions have already published calls on the EURAXESS portal for Expressions of Interest inviting candidates to apply for an MSCA-PF with the support of their institution." At the bottom of the article, there is a purple button with the text "FIND YOUR EUROPEAN HOSTING INSTITUTION NOW".

2. Getting started

- Check approved projects

CORDIS database

<https://cordis.europa.eu/>

MSCA-IF



Project search filters:

- Project acronym
- Project ID
- Call ID
Call ID
Please use the ENTER key to enter values
- Funding scheme**
MSCA-IF
- Start date
- End date
- EU contribution

Programme: H2020-EU.1.3.2
Last update: 23 April 2021 [Add to my booklet](#)

HORIZON 2020
PROJECT

PROS-VARIANT PIK3CA-Related Overgrowth Spectrum: molecular mechanisms and preclinical modelling of PIK3CA VARIANTS
ID: 101026227
From: 1 September 2022 to: 31 August 2024
PIK3CA-related overgrowth spectrum (PROS) is a group of rare congenital disorders that manifest as complex syndromes with overgrowth of several tissues (vasculature, adipose and muscle tissues, bones, brain and skin among others) or as localized lesions such as...
Coordinated in: Spain
Programme: H2020-EU.1.3.2
Last update: 15 April 2021 [Add to my booklet](#)

HORIZON 2020
PROJECT

PHYCOCYP PHYtoplankton responses to organic CONTaminants: the role of CYtochrome P450
ID: 101030396
From: 1 September 2021 to: 31 August 2024
Anthropic activities result in a continuous release of Organic Contaminants (OCs) in the aquatic environment and chemical pollution may considerably affect phytoplankton that are

3. Timeline

- Ideas and contact with supervisor (mid-July)
- First draft (COMPLETE!) (end-August)
- Corrections and revisions (September and October)



- Deadline (12 Oct. 17: 00 h – Brussels time)

4. Proposal

- Excellence
- Impact
- Implementation

Scores

0 – *The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.*

1 – Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2 – Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3 – Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4 – Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5 – Excellent. *The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.*

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Minimum 4.7

4. Proposal

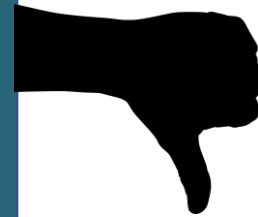
- Excellence

1. Research & Innovation

- Why this project?
- Why you?
- Why now?

- Broad scientific impact
- Test of hypothesis that is relevant for a whole discipline
- Paradigm shift
- Interdisciplinary research
- Scale-up
- Use of new technologies

- Case study
- Replicate study
- New method for an old question



4. Proposal

- Excellence

1. **Research & Innovation**

2. Methods (interdisciplinary approach, gender issues, open science, engagement with society)

3. Two-way knowledge transfer

4. Proposal

Excellence: research & innovation

- Easy-to read text
- Present the rational behind your project
- Present a visually engaging figure
- Show scientific credibility
- Show that you can do the work

START PAGE COUNT – MAX 10 PAGES

1 EXCELLENCE



1.1 QUALITY AND CREDIBILITY OF THE RESEARCH/INNOVATION PROJECT: LEVEL OF NOVELTY, APPROPRIATE CONSIDERATION OF INTER/MULTIDISCIPLINARY AND GENDER ASPECTS

Without taxonomy, ecological research is unthinkable. Key aspects of ecology, from understanding biodiversity to identifying conservation targets, depend on how organisms are classified. For ecologists, the importance of taxonomy is therefore undisputed. Yet most sub-disciplines of ecology, including macroecology, treat the taxonomic classification of organisms as static, while in reality it is dynamic and subject to periodic change (Fig. 1). This discrepancy only stems from the divergent focus of both disciplines: whereas taxonomy treats species as hypotheses that can be tested with scientific evidence, macroecology requires species classifications as a solid reference to capture biodiversity patterns across spatial scales¹. Bridging the divergence by a framework, taking the dynamic nature of taxonomic classification with macroecology has not been attempted in a systematic manner but would allow uncovering the impact of taxonomic change on biodiversity patterns². Such framework, however, is still missing because the necessary methods of data-intensive research became available only recently³. The scientific challenge of incorporating taxonomic change into macroecology is the focus of TAXON-TIME.

This project directly addresses a long-standing research problem in macroecology: the observation that for decades estimates of global species richness still do not converge^{4,5}. This problem arises in part because estimates are heavily dependent on the counts of individual species – a parameter that by itself is uncertain and bound to change⁶ following the discovery, description, and classifications of species^{7,8}. Recent advances from species characteristics⁹ to research practices^{10,11} and funding¹² determine both the number of discoveries and the likelihood of taxonomic reclassifications. Plants with conspicuous flowers, for instance, are more likely to attract the attention of taxonomists than plants with unremarkable features¹³. Moreover, thoroughly described species have a lower chance of being reclassified than showing higher taxonomic stability¹⁴. As a consequence, the wealth of taxonomic knowledge – the number of species described, the quality of species descriptions and the frequency of reclassifications – varies consistently across time and regions¹⁵.

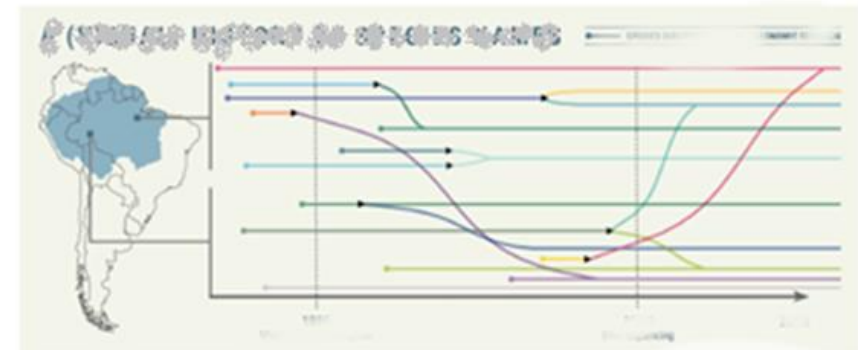


Figure 1. Schematic timeline covering 250 years of discoveries and reclassifications of species recorded at two sites in Amazonia; line colours represent individual species, dashed lines mark the time points of biodiversity sampling; the number of species intersecting these lines changes over time.

Of the two thousand vascular plant species newly described each year in the last decade around the world, only half come from newly collected specimens; the other half come from the discovery of already existing herbarium vouchers¹⁶ following improved molecular and morphometric techniques, and the use of new ways, and outside access to biological information through the digitalization of herbaria specimens and their metadata¹⁷. Yet, taxonomists often vary greatly across countries. While Brazil, China and Australia describe 250 new vascular plant species yearly, very poor species-rich countries, such as Gabon or the Democratic Republic of Congo, describe much less species¹⁸.

¹Tessardo et al. (2017) *Ecol Evol*, 7:8863. ²Yay et al. (2013) *Trends Ecol Evol*, 18: 587-603. ³Mortal et al. (2013) *Ann Rev Ecol Syst*, 44:523. ⁴Calay et al. (2014) *Trends Ecol Evol*, 29:187-188. ⁵Fritz & Stiller (2017) 1-12. ⁶De Siqueira et al. (2013) *Science*, 342:1243-1246. ⁷Cardoso (2017) *PNAS*, 114: 0895-10706. ⁸Lomolino (2004) in *Frontiers of Biogeography: New Directions in the Geography of Nature*, ed. Lomolino & Heaney, pp. 293. ⁹Diniz-Filho et al. (2005) *Glob Ecol Biogeogr*, 14: 469-477. ¹⁰Troudet et al. (2017) *Nature Sci Rep*, 7:1. ¹¹Sangster & Luksemburg (2015) *Syst Biol*, 64:144. ¹²Altrands et al. (2011) *Diversity Distrib*, 17: 191-200. ¹³Troudet et al. (2017) *Nature Sci Rep*, 7:1. ¹⁴Sangster & Luksemburg (2015) *Syst Biol*, 64:144. ¹⁵Kew Royal Botanic Gardens (2016) *State of the World's Plants 2016*. ¹⁶Fay (2015) *Ann Rev Ecology, Syst Syst* 46:268.

4. Proposal

■ Excellence: Research & Innovation

In a few sentences:

- What is known?
- What is unknown?
- How are you going to close a specific knowledge gap?
- Trigger curiosity, present contrasting ideas, new view on a old topic, etc.



Example:

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4. Proposal

- Excellence: Research & Innovation

- Background information for a broad audience (avoid jargon)
- Figure; photo; graph...

START PAGE COUNT – MAX 10 PAGES

1 EXCELLENCE



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This project directly addresses a long-standing research problem in macroecology: the estimation of global species richness still does not converge^{5,6}. This problem arises in part because estimates are heavily dependent on the counts of individual species – a parameter that by itself is uncertain and bound to change⁷ following the discovery, description, and classification of species⁸. Current estimates from species characteristics⁹ to research practices^{10,11} and funding¹² determine both the number of discoveries and the likelihood of taxonomic reclassifications. Plants with conspicuous flowers, for instance, are more likely to attract the attention of taxonomists than plants with unremarkable features¹³. Moreover, thoroughly described species have a lower chance of being rediscovered and showing higher taxonomic stability¹⁴. As a consequence, the wealth of taxonomic knowledge – the number of species described, the quality of species descriptions and the frequency of reclassifications – varies consistently across time and regions¹⁵.

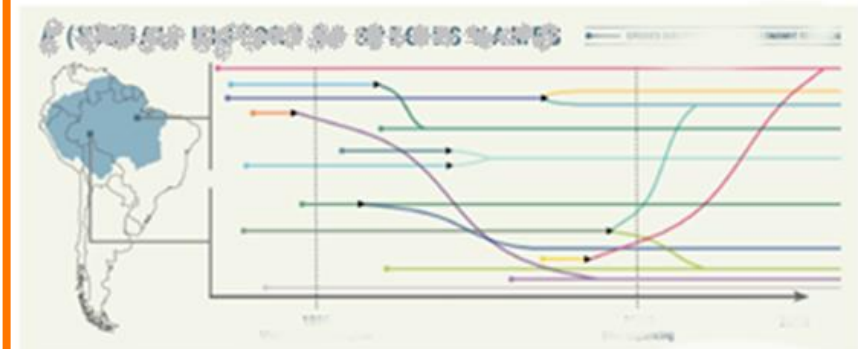


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Of the two thousand vascular plant species newly described each year in the last decade around the world, only half come from newly collected specimens; the other half come from the analysis of already existing herbarium vouchers¹⁶ following improved molecular and morphometric techniques, and the use of databases, and worldwide access to biological information through the digitization of herbaria specimens¹⁷ and their reuse¹⁸. Yet, taxonomists often vary greatly across countries. While Brazil, China and Australia describe 250 new vascular plant species yearly, globally species-rich countries, such as Gabon or the Democratic Republic of Congo, describe much less species¹⁹.

¹Tessardo et al. (2017) *Ecol Evol*, 7:8863. ²Yay et al. (2003) *Trends Ecol Evol*, 18: 587-603. ³Mortal et al. (2013) *Ann Rev Ecol Syst*, 44:523. ⁴Calay et al. (2014) *Trends Ecol Evol*, 29:187-188. ⁵Fritz & Stener (2017) 1-12. ⁶See Dudgeon et al. (2013) *Science*, 342:1243-1248. ⁷Cardoso (2017) *PNAS*, 114: 0895-10706. ⁸Lomolino (2004) in *Frontiers of Biogeography: New Directions in the Geography of Nature*, ed. Lomolino & Heaney, pp. 293. ⁹Diniz-Filho et al. (2005) *Glob Ecol Biogeogr*, 14: 469-477. ¹⁰Troudet et al. (2017) *Nature Sci Rep*, 7:1. ¹¹Gangster & Lukenburg (2015) *Syst Biol*, 64:144. ¹²Alvares et al. (2011) *Diversity Distrib*, 17: 191-200. ¹³Troudet et al. (2017) *Nature Sci Rep*, 7:1. ¹⁴Gangster & Lukenburg (2015) *Syst Biol*, 64:144. ¹⁵Kew Royal Botanic Gardens (2016) *State of the World's Plants 2016*. ¹⁶Fay (2015) *Ann Rev Ecology, Syst Syst* 46:398.

4. Proposal

- Excellence: Research & Innovation

- Show how the project is organized in work packages.
- Research questions presented by WP.

The resulting variation of taxonomic knowledge across taxa and regions influences our view of biodiversity. Part of the problem is addressed by macroecological models that account for unequal sampling effort when extrapolating species richness over large under-sampled areas^{[17][18]}. Yet the impact of taxonomic change on macroecological predictions remains poorly understood. Addressing this problem starts by identifying drivers of taxonomic change and uncovering its temporal and spatial dynamics^[19]. Efforts in this direction are still scarce^[4], except for a few case studies and regional^[20].

The emergence of global biodiversity databases and new methods of data-intensive research has recently unlocked massive volumes of historical data documenting the temporal and spatial dynamics of taxonomic discoveries and reclassifications^{[21][24]}. While these new data can help macroecologists in developing a probabilistic understanding of biodiversity, they can also help taxonomists to gain insights of the underlying processes of taxonomic discoveries, which is key for setting priorities for future research^[25].

OBJECTIVES & OVERVIEW OF THE PROJECT

TAXON-TIME aims to scrutinize taxonomic effort across the 250 years of taxonomic history of African and Amazonian tree flora and analyse its impacts on macroecological patterns of species abundance and richness (Box 1). The two biomes represent the largest rainforests in the world and harbour extraordinary tree diversity. Taxonomic efforts in African and Amazonian rainforests still remain patchy^{[26][27]}, many tree species are still unknown and many more would disappear before being accurately described. Understanding past taxonomic efforts (WP1) can help to establish priorities for future taxonomic research (WP2), while providing empirical evidence of how change in taxonomic classification impacts our understanding of biodiversity (WPs 3, WP4).

Box 1. Research questions addressed by TAXON-TIME

OVERARCHING QUESTION: What drives shifts in taxonomic knowledge over time and how do these shifts affect our understanding of biodiversity?	
WP1	DATABASE OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS OF AFRICAN AND AMAZONIAN TREES Completion of a first database tracing the history of taxonomic discoveries and reclassifications, complemented with ancillary information on species descriptions
WP2	TRACING THE HISTORY OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS Q1) Which attributes of species descriptions lead to taxonomic reclassifications? Q2) How do taxonomic discoveries and reclassifications change over time in African and Amazonian rainforests over time? Q3) Does taxonomic research embrace taxa most threatened by forest loss?
WP3	INCORPORATING TAXONOMIC RECLASSIFICATIONS INTO MACROECOLOGICAL MODELS Q4) How does taxonomic reclassification affect macroecological patterns of tree species abundance across African and Amazonian rainforests?
WP4	INCORPORATING TAXONOMIC RECLASSIFICATIONS INTO BIODIVERSITY INDICATORS Q5) How will future taxonomic discoveries and taxonomic reclassifications shape macroecological patterns of species richness across African and Amazonian rainforests?

RESEARCH BACKGROUND AND APPROACH – Using the tree floras of African and Amazonian rainforests as a model group, TAXON-TIME will conduct original research to link taxonomy and macroecology. This research will be applied to integrate data documenting 250 years of taxonomic discoveries, taxonomic reclassifications and botanical sampling of African and Amazonian rainforests.

STUDY SYSTEM AND MODEL GROUP – The tree floras of African and Amazonian rainforests, hereafter African and Amazonian trees, are the ideal model group for TAXON-TIME for three reasons. First, owing to their iconic status and contribution to global ecosystem services, African and Amazonian trees have attracted the attention of scientists^[28]. Second, vouchers from African and Amazonian rainforests, from African and European herbaria^[29], as those of Amazonian trees are mainly stored in the Americas^[30]. This makes the comparison of similarities and differences of herbarium practices between the two continents. Finally, outstanding data resources (specimen collections, botanical monographs, plant inventories, accessible and well-curved species checklists) are available for African and Amazonian trees. No larger group of tropical plants is served better with such resources.

WP1: DATABASE OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS OF AFRICAN AND AMAZONIAN TREES
LIST OF AMAZONIAN AND AFRICAN TREES – To compile the database, TAXON-TIME will use recently collated checklists for African^[31] and Amazonian^[32] trees. The checklist for African trees is extracted from the FUNBIO database^[33] that contains 3000 names of tree species. The two checklists for Amazonian trees together comprise 1000 tree species. In divergences in the names contained in the checklists for Amazonian trees, TAXON-TIME will take a conservative and heuristic approach:

^[1]Rocchini et al. (2017) *Sci Tot Environ*, 584–585:282. ^[2]Edie et al. (2017) *PNAS*, 114:3666. ^[3]Steege et al. (2013) *Science*, 342:1243092. ^[4]Franz et al. (2017) *Cladistics*, doi:10.1111/clad.12201. ^[5]Nickolson et al. (2012) *Zootaxa*, 3477:1. ^[6]Vences et al. (2013) *Zootaxa*, 3636:201-244. ^[7]International Plant Name Index. <http://www.ipni.org>. ^[8]Biodiversity Heritage Library. <https://www.biodiversitylibrary.org/>. ^[9]Global Biodiversity Information Facility (GBIF) <https://www.gbif.org/>. ^[10]Gossef (2017). *BMC Bio*, 15:15. ^[11]Steege et al. (2016) *Nat Sci Rep*, 6:29549. ^[12]Dauby et al. (2016) *Phytotkeys*, 74:1-18. ^[13]<http://asdn.myspecies.info/>. ^[14]<http://www.forestplots.net>. ^[15]Strapp et al. (2016) *Glob Ecol Biogeogr*, 25: 1085–1096.

4. Proposal

■ Excellence: Methods

- For each WP, provide a short description of the methods.

species names will be considered valid if they appear on both lists. All species names will be checked against nomenclatural databases^{19,20} and if determined valid, included in the database. This approach will lead to one workable checklist for each African and Amazonian tree (milestone M1). The database will be used as a starting checklist for the application of taxonomic expertise (ER) as an expert taxonomist (see Chapter 2) to complete the database and to ensure a high quality of the data.

NOVEL DATABASE OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS (T4-DB) - TAXON-TIME will use the taxonomic checklist (M1) to construct a comprehensive database documenting discoveries and reclassifications of African and Amazonian tree species over the past 250 years. This database on Temporal Taxonomy of Tropical Trees, hereinafter T4-DB, will record the history of species names and attributes associated to each species description. T4-DB will be compiled by adhering to a rigid Data Management Plan²¹ (D1). **1. Explorative research, data collection and organization:** A literature survey will identify attributes to approximate quality of species descriptions (M2). A preliminary analysis²² suggests the following: 1) number of pages devoted to species description, 2) number of specimens and geographic range covered in a description, 3) number of taxa the type specimen was compared with, 4) presence of vouchers in natural history collections, 5) presence of images in the original description/revision and 6) use of integrative taxonomy (morphological, genetic and spectroscopy data) to describe a species. The world-leading taxonomic experience of the host organization (Centro Nacional de Ciencias Naturales, MNCN-CSIC) and the collaborating institutions (CONICET, INIA, RUIB-CSIC) will ensure that appropriate proxies for the quality of species descriptions are identified. Information on the identified proxies will be: (i) extracted with advanced text mining techniques²³ from botanical literature (e.g. Flores & Monographs), digitally archived through the Biodiversity Heritage Library and Global Plants²⁴ and (ii) validated against Tropicos²⁵, The Plant List²⁶, and The Catalogue of Life²⁷.

Ontology-driven data integration, a promising technique to streamline data assembling²⁸, will be used to link information retrieved from the various sources. The compilation of T4-DB will benefit from the expertise in Knowledge Discovery and Data Mining of the supervisor at partner organization (Prof. Schmitter at University of Luxembourg, UL) and UL's world-class infrastructure for data-intensive research. A six-month second phase will be completed in the early phase of TAXON-TIME will guarantee the database is timely compiled, 2. quality control: A quality check will verify the assignment of species names to years, authors and/or attributes. To this end, a standard protocol for data filtering will be developed. Experts of the African and Amazonian tree flora (incl. Dr Dauby and Prof ter Steege) will be consulted to verify specific entries (M3). 3. Metadata documentation, data storage: A scheme for documenting metadata, aligned with the Darwin Core standard, will be adopted to ensure universal usability of T4-DB. The validated database (D2) will be deposited at a public repository (e.g., Zenodo).

WP3: TRACKING THE HISTORY OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS

TAXON-TIME will use T4-DB to reconstruct the history of taxonomic discoveries and reclassifications for African and Amazonian trees. A Bayesian phylogenetic analysis will be selected to infer rates and drivers of change in species names. TAXON-TIME will replace the connections between ancestor and descendant species that are typically established as sets of phylogenetic trees by connections between species sharing a common name (Fig. 1). Then, *character-dependent diversification-rate models*²⁹ will determine: 1) correlations between rates at which species names change and the attributes of species descriptions; and 2) the probability that species *j* undergoes a change of name at time *t* (M6). This analysis will reveal taxa for which taxonomic stability results either from increased quality of taxonomic descriptions or from taxonomic effort (M5).

Based on this analysis, TAXON-TIME will go one step further and uncover the geography of taxonomic stability. The probability that species *j* undergoes a change of name at time *t* (M6) will be associated with information on the species' geographical location. Geo-referenced locations of species occurrences will be extracted from: 1) data portals (e.g., GBIF); and 2) databases of tree inventories (such as Forestplots.net³⁰, ATDN³¹, and RainBio³²). The ER is member of Forestplots.net and ATDN. Dr Dauby is part of RAINBIO and will facilitate access to these data. Species locations will be screened for erroneous/uncertain positioning³³. After associating the probability for a name change with the location of species, spatial interpolation will produce a continuous surface of probability of changing names across African and Amazonian rainforests for discrete time intervals. These maps will be merged into a single map in order to identify regions where taxonomic stability is high (M7). A distinction between areas of taxonomic stability due to high quality taxonomic descriptions or lack of taxonomic effort will be made. The final map of taxonomic stability will be overlaid with contemporary maps of land cover (M5) to analyse whether taxonomic effort embraces taxa that predominately occur in deforested areas (D3; M7). Standardised (and comparable) measures of deforestation for African and Amazonian rainforests will be retrieved from the deforestation history of Tropical Ecoregions³⁴.

This innovative assessment of taxonomic knowledge is key for supporting current taxonomic efforts and establishing priorities for taxonomic research³⁵, an important task by the Global Taxonomic Initiative (GTI)³⁶ and the Consortium of European Taxonomic Facilities (CETAF)³⁷, both operating under the umbrella of the International Convention on Biological Diversity. TAXON-TIME results can help countries evaluating by 2020 their progress towards the Aichi Biodiversity Target 12: "ensuring that information on biodiversity has increased in recent years; there are still gaps in understanding biodiversity that need to be filled, such as those related to taxonomy."³⁸

This WP draws on the experience of the ER^{39,40,41} and the world-leadership of Dr Hortal (Scientist-in-Charge) in macro-ecological modelling^{42,43} and scrutinizing biodiversity data⁴⁴. The expertise of Dr Sanchez in Bayesian analysis^{45,46,47}, Dr Bastin in spatial modelling⁴⁸ and Dr Dauby and Prof ter Steege on African and Amazonian tree floras will ensure completion of this WP [D3; paper submitted to *Science* (JIF2016= 37.206), or *Science Advances* (JIF2017= 11.51)].

¹⁹Boyle, B. et al. (2013) BMC Bioinform. 14:16. ²⁰Recknagel, F. & Michener, W. Eds. (2018) Ecological Informatics. 978-3-319-59929-1. ²¹The Plant List. <http://www.theplantlist.org/>. ²²Tropicos <http://www.tropicos.org/>. ²³The Plant List. <http://www.theplantlist.org/>. ²⁴The Catalogue of Life. <http://www.catalogueoflife.org/>. ²⁵Bohner et al. (2012) Trends Ecol Evol 27: 85-93. ²⁶Madison (2007) Syst Biol. 56:701. ²⁷<http://www.forestplots.net>. ²⁸<http://atdn.myspecies.info/> ²⁹United Nations (FAO), Global Forest Resources Assessment (FAO, Rome, 2010). ³⁰Smith et al 2015 Phytotaxa. ³¹<https://www.cbd.int/gti/>. ³²<https://cetaf.org>. ³³Conventual on Biological Diversity. <https://www.cbd.int>.

4. Proposal

- Excellence: Methods

- How to convince evaluators that you are able to do the work?
- Show that you have done similar work before (cite your own articles or those of your supervisor).

species names will be considered valid if they appear on both lists. All species names will be checked against nomenclatural databases^[47,48] and if determined valid, included in the database. This approach will lead to one workable checklist for each African and Amazonian tree (milestone M1). The experience in handling checklists of the applicant (Senior Experienced Researcher ER) as well as of Dr Dauby and Prof ter Steege as members of the Project Advisory Panel, will ensure a swift execution of this task.

NOVEL DATABASE OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS (T4-DB) - TAXON-TIME will use the taxonomic species checklists (M1) to compile a novel taxonomic database documenting discoveries and reclassifications of African and Amazonian tree species over the past 250 years. This database on Temporal Taxonomy of Tropical Trees, hereinafter T4-DB, will record the history of species names and attributes associated to each species description. T4-DB will be compiled by adhering to a rigid Data Management Plan^[49]. 1. Explorative research, data collection and organization: A literature survey will identify attributes to approximate quality of species descriptions (M2). A preliminary analysis^[50] suggests the following: 1) number of pages devoted to species description, 2) number of specimens and geographic range covered in a description, 3) number of taxa the type specimen was compared with, 4) presence of vouchers in natural history collections, 5) presence of images in the original description/revision and 6) use of integrative taxonomy (morphological, genetic and spectroscopy data) to describe a species. The world-leading taxonomic experience of the host organization (Centro Nacional de Ciencias Naturales, MNCN-CSIC) and the collaborating institution (Universidad Nacional de Colombia, RUB-CSIC) will ensure that appropriate proxies for the quality of species descriptions are identified. Information on the identified proxies will be: (i) extracted with advanced text mining techniques^[51] from botanical literature (e.g., Flores & Monographs), digitally available through the Biodiversity Heritage Library and other Global Plants and (ii) attributed in T4-DB to the respective species name. Taxonomic information about synonyms will be retrieved from IPNI^[52], Tropicos^[53], The Plant List^[54], and The Catalogue of Life^[55]. Ontology-driven data integration, a promising technique to streamline data assembling^[56], will be used to link information retrieved from the various sources. The compilation of T4-DB will benefit from the expertise in Knowledge Discovery and Data Mining of the supervisor at partner organization (Prof. Schummer at University of Luxembourg, UL) and UL's world class infrastructure for taxonomic research^[57].

TAXON-TIME will guarantee the database is timely compiled, 2. Quality control: A quality check will verify the assignment of species names to years, authors and/or attributes. To this end, a standardized protocol for data filtering will be developed. Experts of the African and Amazonian tree flora, incl. Dr Dauby and Prof ter Steege, will be consulted to verify specific entries (M3). 3. Metadata documentation and storage: A scheme for documenting metadata, aligned with the Darwin Core standard, will be adopted to ensure the interoperability of T4-DB. The compiled database (DB) will be deposited in a public repository (e.g., Tropicos).

WP4: TRACKING THE HISTORY OF TAXONOMIC DISCOVERIES AND RECLASSIFICATIONS
TAXON-TIME will use T4-DB to reconstruct the history of taxonomic discoveries and reclassifications for African and Amazonian trees. A Bayesian phylogenetic analysis will be conducted to infer rates and drivers of discovery of species names. TAXON-TIME

Example: The experience of the ER [47,48,30] in bla-bla and the world-leadership of XX (Scientist-in-Charge) in bla-bla-bla [e.g.,3] will ensure completion of this WP [D3: paper submitted to ZZZ (JIF2019=xx), or YYY (JIF2019= xx)].

4. Proposal

- Excellence: Two-way knowledge transfer
 - How important is the project for developing your scientific skills?
 - Importance of the project for your career
 - How important is the project for your host institution?
 - Importance of the project for the host institution

1.3 *Quality of the supervision, training and of the two-way transfer of knowledge between the researcher and the host*

At a minimum, address the following aspects:

- Describe the qualifications and experience of the supervisor(s). Provide information regarding the supervisors' level of experience on the research topic proposed and their track record of work, including main international collaborations, as well as the level of experience in supervising/training, especially at advanced level (i.e. PhD and postdoctoral researchers).
- Planned training activities for the researcher (scientific aspects, management/organisation, horizontal and key transferrable skills...).
- For *European Fellowships*: two-way transfer of knowledge between the researcher and host organisation.
- For *Global Fellowships*: three-way transfer of knowledge between the researcher, host organisation, and associated partner for outgoing phase.
- Rationale and added-value of the non-academic placement (if applicable).

<https://ec.europa.eu/research/mariecurieactions/calls/msca-postdoctoral-fellowships-2021>

4. Proposal

- Excellence: Two-way knowledge transfer

- Which skills will you acquire?
- How? Course, meetings, hands-on-training, etc.
- With whom? Names of researchers or institutions involved in the training

Training (two tables)
 host institution → candidate
 candidate → host institution

1.2 QUALITY AND APPROPRIATENESS OF THE TRAINING AND OF THE TWO WAY TRANSFER OF KNOWLEDGE BETWEEN THE RESEARCHER AND THE HOST

Training is tailored to expand ER's specific research and career development skills in macroecology and methods for data-intensive research. Knowledge will be transferred to the mutual benefit of ER, MNCH-CSIC, UL and collaborating organizations, with a view on their specific needs and strengths.

TRANSFERABLE SKILLS FROM THE HOST AND COLLABORATING INSTITUTIONS TO ER

TRAINING ON RESEARCH SKILLS: ER will receive outstanding training in three areas (Table 1). 1. Data-intensive research⁹⁸. The ER will expand her skills on compiling and analysing large databases through dedicated training sessions and guidance of Prof Schommer during reconcoment to UL (WP1). Knowledge will be acquired on state-of-the-art methods for data management planning, knowledge discovery and data mining, ontology-driven data curation and integration, data quality control, exploratory analysis and visualization of large datasets. 2. Bayesian statistics and scripting for reproducible data analysis. The ER will learn scripting Bayesian analysis using the open software RevBayes⁹⁹ for Bayesian inference (WP2). This software offers an R-like interactive language in a C++ environment with more speed for processing. Training will be provided through the course MADPHYLON⁹⁸ and interaction with Dr Sanmartín. The ER will also receive training in Bayesian statistics under R environment by collaborating with Dr Rocchini (TMM). 3. Macroecological modelling and methods for macroecological modelling. The ER will fit the technical skills acquired under Points 1 and 2 into a theoretical framework that links taxonomy and macroecology through mentoring from Dr Hortal (Scientist-in-Charge), broadening her theoretical knowledge and positioning TAXON-TIME into the forefront of macroecology. Dr Hortal is pioneer in assessing quality and bias in biodiversity data and expert in macroecological models. His mentoring will be delivered through direct collaboration and regular meetings (30-min weekly and 90-min monthly, plus lab meetings every second week), followed by larger meetings and work sessions when needed. The ER will eventually take formal courses when appropriate.

TRAINING OBJECTIVES FOR CAREER DEVELOPMENT SKILLS: TAXON-TIME will provide wide-ranging training opportunities on skills necessary for the ER's future career development (Table 2). This training will be delivered mostly via mentoring from Dr Hortal and formal courses provided by UL. 1. Science leadership, writing and presentation skills. The ER will be mentored to enhance her science communication skills, enhancing her demonstrated ability to publish research in prominent journals (D3, D4, D5), deliver oral presentations (Dr1, Dr2, Dr4) and expand her outreach work (D6, D7, D8, D9, D10). The ER will develop her skills in communicating her research activities to broad audiences through MNCH-CSIC and UL media outlets (Dr1, Dr2). 3. Supervising skills. The ER will be involved in supervising MSc students at MNCH-CSIC and UL (p3 & p4). 4. Grant writing skills and networking skills. The ER will enlarge her scientific network by interacting with the extensive networks of Dr Hortal and Prof Schommer, and by enabling interaction between all researchers involved in TAXON-TIME. 5. Administrative skills and budget management skills. The ER will have autonomy in her day-to-day work and budget responsibilities (supervised by the Scientist-in-Charge and MNCH-CSIC's finance department). This will advance her experience in financial management and project management. When appropriate, the ER will be mentored by the UL's administrative staff on administrative matters.

Table 1. Training activities to transfer knowledge and skills from host and collaborating organizations to ER; TR- training-through-research; HoT - hands-on training of scientific skills; CD - career development skills

TRANSFERRED TRAINING AND SKILL	TYPE OF TRAINING	STRATEGY TO ACQUIRE TRANSFERABLE KNOWLEDGE AND SKILL	INVOLVED STAFF FROM HOST OR COLLABORATING ORGANIZATIONS
1: Data-intensive research	TR; HoT	i) Weekly meetings on concepts, techniques and revision of scripts; ii) course on Knowledge Discovery and Data Mining; iii) dissemination of data and scripts on public repositories	Prof Schommer
2: Bayesian statistics (RevBayes)	TR; HoT	i) 10-days intensive MADPHYLON on Bayesian inference; ii) ad-hoc and/or quarterly meetings meeting design and implement analysis; iii) joint writing of papers	Dr Sanmartín
3: Bayesian statistics (R environment)	HoT	i) short stay at Dr Rocchini's lab to implement Bayesian models in R; ii) joint writing of papers	Dr Rocchini
4: Macroecological modelling	TR; HoT	i) periodic meetings on concepts, frontiers of macroecology and modelling approaches; ii) joint writing of papers	Dr Hortal
5: Career development	CD	i) interaction with research networks of MNCH-CSIC, UL and the advisory panel; ii) research presentations, outreach to stakeholders	MNCH-CSIC, UL, Advisory Panel

TRANSFERABLE ER SKILLS TO THE HOST AND COLLABORATING INSTITUTIONS: Skills gained by the ER during TAXON-TIME, her pre-existing skills and collaboration network will considerably enhance research, networking and training opportunities for both MNCH-CSIC and UL (Table 2).

4. Proposal

- Excellence
- Impact
- Implementation

Interpretação das notas:

0 – *The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.*

1 – Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2 – Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3 – Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4 – Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5 – Excellent. *The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.*

Minimum 4.7

■ **Impact: Dissemination & Exploitation**

- **Output based on scientific deliverables:** e.g., *TAXON-TIME One oral presentation at xx.*
- **Key message [Deliverable]**
- **Targeted audience:** e.g., *TAXON-TIME: Modelling communities (e.g. ISIMIP) and biodiversity data experts, operators of biodiversity data infrastructure; BSc and MSc students, with attention to early career female researchers*
- **Expected impact:** e.g., *TAXON-TIME: results firmly disseminated within the scientific community. Young women encouraged to explore methods of data-intensive research*

2.2 QUALITY OF THE PROPOSED MEASURES TO EXPLOIT AND DISSEMINATE THE PROJECT RESULTS
A rigid dissemination plan will be implemented to ensure TAXON-TIME firmly reaches the intended audience, including taxonomists, biodiversity data experts, policy makers and policy funding agencies (Table 5). The dissemination of data is formalised under the Data Management Plan (DMP) which outlines the results of TAXON-TIME available for policy makers (living, using, or not lend themselves for direct use in legislative activities. The dissemination plan will be subject to a periodic review during the entire course of the project (Table 5).

Table 3. Dissemination plan for the results of TAXON-TIME

OUTPUT BASED ON SCIENTIFIC DELIVERABLES	KEY MESSAGE AND DELIVERABLES*	TARGETED AUDIENCE	EXPECTED IMPACT
1: Three articles published in open access and preprint servers; data deposited in public archives (GitHub or Zenodo) and on D2	- Answer to the question: "How African shifts in taxonomic knowledge over time also have driven the scientific understanding of biodiversity?"	Taxonomists, taxonomic and ecological researchers	i) TAXON-TIME results firmly disseminated within the scientific community; paradigm shift in macroecology
2: One oral presentation delivered in an international conference focusing on global biodiversity opportunities (D1)	TAXON-TIME delivers an estimated world-wide taxonomic reclassification (D1)	Modelling communities (e.g. ISIMIP) and biodiversity data infrastructure ²	High visibility of project's result and the scientists involved in TAXON-TIME among scientists and biodiversity data experts
3: Two oral presentations, one at the European Commission and one at a governmental body (e.g. Spanish D1)	Research reveals taxonomic regions for which taxonomic data is most urgent (D1)	Policy makers and citizens (ARC, EC, and other agencies)	Increase awareness of governmental bodies in Europe and Brazil about the importance of funding taxonomic research
4: One Post in a popular science magazine, MNCN-CSIC (Spain), INPA (Brazil), Naturalis (the Netherlands), D2	Topic of men- and data-intensive science in macroecology (D2)	BSc and MSc students, with attention to early career female researchers	Encourage young women to explore a methods of data-intensive research
5: One oral presentation delivered in an international conference focusing on botany and tropical resources (D2)	Public scientific approach to taxonomic data in sciences macroecological studies (D4)	General public, taxonomic, botanical ecologists, and macroecologists	Paradigm shift in taxonomy and macroecology

2.3 QUALITY OF THE PROPOSED MEASURES TO COMMUNICATE THE PROJECT ACTIVITIES TO DIFFERENT TARGET AUDIENCES

Consistent with the dissemination of results, the research activities of TAXON-TIME will be communicated to a wider audience through a rigid communication plan. Awareness of the project will be lay public interested in Natural History Collections, exhibitions and gender balance in research (Table 5). Project activities will be communicated during the entire course of TAXON-TIME (Table 5).

Table 4. Communication plan for the activities of TAXON-TIME

OUTPUT	KEY MESSAGES AND DELIVERABLES*	TARGETED AUDIENCE	EXPECTED IMPACT
1: Project website and video	TAXON-TIME fosters taxonomy and macroecology	General public interested in natural history collections	i) High visibility of TAXON-TIME will involve digital marketing, increasing awareness about the relevance of Natural History Collections and IT tools for macroecology
2: Multimedia exhibition in the permanent exhibition	TAXON-TIME is novel for the first time about taxonomic knowledge about Amazonian and African trees in the past 250 years (D2)	General public interested in natural history collections	ii) High visibility of TAXON-TIME will increase awareness about European contributions to taxonomic and global biodiversity research
3: Participation in events as MSCA ambassador	TAXON-TIME supports the contribution of natural history collections to global biodiversity research	General public interested in natural history collections	iii) Increase awareness about the importance of funding taxonomic research for global biodiversity research
4: Participation in the "Día de la Ciencia en la Ciencia" promoted by the UN and organized by "Fundación para el desarrollo científico"	TAXON-TIME explores the contribution of female taxonomists to the discovery of Amazonian and African trees (D4)	General public interested in gender awareness	Increased awareness about the scientific contributions of female taxonomists

*Deliverables are specified in Table 5; ²The link to project website and video will be available on the websites of MNCN-CSIC (Spain), Naturalis (the Netherlands), UL (Luxembourg), and Herbarium of the Brazilian Institute for research in the Amazon (INPA). These websites receive thousands of visits from the general public of virtually all ages and professionals of the educational sector; ³MNCN is the largest Spanish Natural History Museum; its exhibitions receive >150K visitors/year; ⁴See footnote in Table 2.

4. Proposal

- Impact: Dissemination & Exploitation

YEAR 1 – Rejected

Results will be communicated during the entire course of TAXON-TIME . **Priority will be given to exploit and disseminate scientific results, giving full access to the database generated** (Table 3). This database will be stored in public repositories such as Zenodo, and will also be available for download at the website of the MNCN (Spain). The target audience of both phases will be the general public, policy makers, donors and young and senior researchers”.

YEAR 2 – Approved

A rigid dissemination plan will be implemented to ensure TAXON-TIME firmly reaches its intended **audience, including scientists, biodiversity data experts, but also policy makers** and potential funding agencies (Table 3). **The dissemination of data is formalised under the Data Management Plan (D1).** Although the results of TAXON-TIME have relevance for policy makers (WP2), they do not lend themselves for direct use in legislative activities. **The dissemination plan will be subject to a periodic review during the entire course of the project** (Table 5).

4. Proposal

- Impact: Dissemination & Exploitation

YEAR 1 – Rejected

In line with the guidelines “Communicating EU research and innovation guidance for project participants”, **in Table 4 we outline the activities that will be carried out to maximize the impact of TAXON-TIME.**

Evaluation Report

Weaknesses:

*“Relevant target audiences, such as the local stakeholders in studied tropical regions, **are not adequately discussed in the dissemination Strategy**”.*

YEAR 2 – Approved

“Consistent with the dissemination of results, the research activities of TAXON-TIME will be communicated to a wider audience through a rigid communication plan. **Addressees of this plan include the lay public interested in Natural History Collections, scientific events and gender balance in research** (Table 4). Project activities will be communicated during the entire course of TAXON-TIME (Table 5)”.

Evaluation Report

Strength:

*The proposed measures to disseminate the project results are clearly presented and described; these will increase the visibility of the project and researcher. The research findings will effectively reach a broad range **of pertinent target groups including the scientific community and policy-makers.***

*–“The planned communication routes and activities that are aimed at **reaching different audiences are impressive and include an ambitious plan for engaging the general public.**”*

Weakness:

Details on potential exploitation of the project results are incomplete.

4. Proposal

- Excellence
- Impact
- Implementation

Scores

0 – *The proposal fails to address the criterion or cannot be assessed due to missing or incomplete information.*

1 – Poor. *The criterion is inadequately addressed, or there are serious inherent weaknesses.*

2 – Fair. *The proposal broadly addresses the criterion, but there are significant weaknesses.*

3 – Good. *The proposal addresses the criterion well, but a number of shortcomings are present.*

4 – Very good. *The proposal addresses the criterion very well, but a small number of shortcomings are present.*

5 – Excellent. *The proposal successfully addresses all relevant aspects of the criterion. Any shortcomings are minor.*

Minimum 4.7

4. Proposal

Implementation

- Gantt Chart organized by WP
- Rows: main activities (as in the text)
- Google: Gantt Chart Templates

Gantt Chart (one table)

Table 5. Work plan of TAXON-TIME. Person-month (pm): one person-month equals 168 hours of work; i.e. 21 days of 8 working

Main research / training activities	Year 1																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15			
WP1: COMPILATION OF T4-DB	Project members involved in task* (pm)																	
i. Compilation of checklist	ER	SiC	SS	LB	GD	DR	IS	HtS	Σ									
ii. Lit. review (proxy quality sp. description)	0.9				0.1			0.1	1.1	M1								
iii. Data mining and T4-DB compilation (UK)**	0.9	0.5						1.4	0.5	0.4								
WP2: TAXONOMIC DISCOVERIES AND REVISIONS	5.9	1.0		0.1			0.1	7.1	M2	T1	D1					D2		
i. Integr. of geo-referenced sp. into T4-DB	0.6							0.6				M4						
ii. Compilation of land-cover data	0.5		0.1					0.6			0.3	0.3	M5					
iii. Charac.-dependent divers.-rate models	1.5						0.8	2.3			0.2		0.3	M6				
iv. Interpolation and overlap analysis	0.4		0.2					0.6					0.5	0.5	0.5	M7		
v. Writing scientific article	2.3	1.0	0.5	0.3	0.3		0.2	0.2	5.3				T2		0.2	0.2	D3	
WP3: MACROEVOLUTIONARY MODELS																	M8	
i. Integration of sp. abundance into T4-DB	0.9							0.2	1.2								0.1	0.8
ii. Models of change in community structure	1.4	0.5						1.9										0.1
iii. Writing scientific article	2.1	1.0	0.5		0.3			0.2	4.1									0.1
WP4: BIODIVERSITY ESTIMATES																		
i. Analysis of time series regression	1.8						0.3		2.1									
ii. Writing scientific article	3	1.0	0.5		0.2	0.3		0.2	5.2									
TOTAL person-month	2.2	4.0	2.5	0.6	1.0	0.6	1.0	1.0	1.0	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
WP5: DISSEMINATION AND COMMUNICATION																		
i. Dissemination and Communication of results	1	0.2						1.2		Cr1				Dr1	Cr2		Dr2	Dr22
WT: PROJECT MANAGEMENT																		
i. Organisation and management	included above																	
ii. Progress reporting										O1	O2							O4
ii. Progress monitoring										P1	P2							P1
										P1	P2							P1

*ER: SiC (Scientist-in-Charge) - Dr Hortat; SS (Supervisor during secondment) - Prof S. S. 1.8 - Dr ...; GD - Dr Daubi; DR - Dr ...; IS - Dr ...; HtS - Prof ter Steege. **Activity during ...

* Milestones [M] - [M1] Check lists of AFR AMZ trees compiled; [M2] Proxy of quality of species description defined based in a literature review; [M3] T4-DB compiled; [M4] Ge Land-cover data compiled; [M6] Character-dependent diversification-rate models built; [M7] Spatial Interpolation of nomenclatural stability performed; [M8] Data on field species change in community structure built; [M10] Bayesian time series analysis performed.

Gantt Chart (one table)

4. Proposal

Implementation

- Milestones and deliverables mentioned in the text
- Balance between ambition and reality; e.g., TAXON-TIME: 2 main papers and 1 database

Table 5. Work plan of TAXON-TIME. Person-month (pm): one person-month equals 168 hours of work; i.e. 21 days of 8 working

Main research / training activities	Project members involved in task* (pm)								Year 1															
	ER	SiC	SS	LB	GD	DR	IS	HtS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
WP1: COMPILATION OF T4-DB																								
i. Compilation of species list	0.9					0.1		0.1	1															
ii. Lit. review (proxy quality sp. description)	0.9	0.5							1															
iii. Data management and compilation (UL)**	5.9		1.0			0.1		0.1	7															
WP2: TAXONOMIC DISCOVERIES AND REVISIONS																								
i. Integr. of geo-referenced sp. into T4-DB	0.6								0															
ii. Compilation of land-cover data	0.5				0.1				0															
iii. Charac.-driven divers.-rate models	1.5							0.8	2															
iv. Interpolation and overlap analysis	0.4				0.2				0															
v. Writing scientific article	2.3	1.0	0.5	0.3	0.3		0.2	0.2	5															
WP3: MACROEVOLUTIONARY MODELS																								
i. Integration of sp. abundance into T4-DB	0.9							0.2	1															
ii. Models of change in community structure	1.4	0.5							1															
iii. Writing scientific article	2.1	1.0	0.5			0.3		0.2	4															
WP4: BIODIVERSITY ESTIMATES																								
i. Analysis of time series regression	1.8							0.3	2															
ii. Writing scientific article	3	1.0	0.5			0.2	0.3	0.2	5															
TOTAL person-month	22.2	4.0	2.5	0.6	1.0	0.6	1.0	1.0		1.0	0.8	1.0	1.0	1.0	1.0	1.0	0.6	1.0	1.0	1.0	1.0	0.7	1.0	
WP5: DISSEMINATION AND COMMUNICATION																								
i. Dissemination and Communication of results	1	0.2							1															
WT: PROJECT MANAGEMENT																								
i. Organisation and management	included above																							
ii. Progress reporting																								
ii. Progress monitoring																								

Milestones [M] – [M1] Species check compiled; [M2] Proxy of xxx based in a literature review; [M3] Database compiled; [M4].. [M10] Bayesian time series analysis performed.

Deliverables [D] – [D1] Data management plan delivered; [D2] Database uploaded to a public repository; [D3] Paper WP2 submitted; [D4] Paper WP3 submitted; [D5] Paper WP4 submitted.

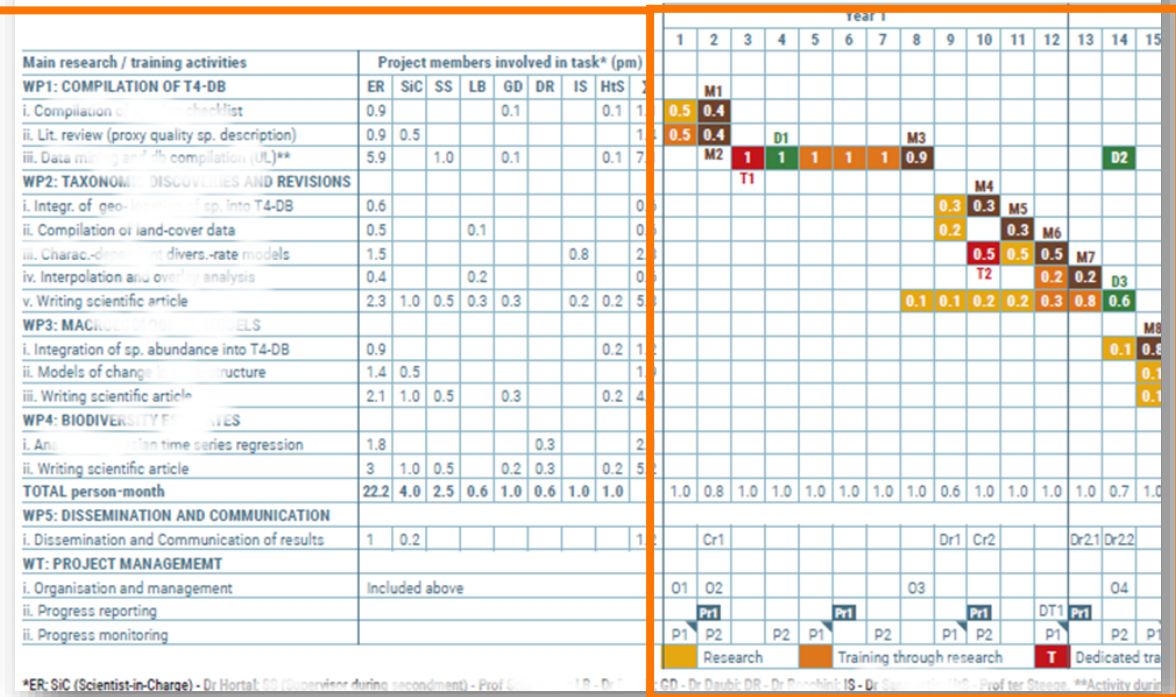
4. Proposal

Implementation

- Milestones and deliverables mentioned in the text
- Balance between ambition and reality; e.g., TAXON-TIME: 2 main papers and 1 database

Gantt Chart (one table)

Table 5. Work plan of TAXON-TIME. Person-month (pm): one person-month equals 168 hours of work; i.e. 21 days of 8 working



Training [T] – [T1] Data Mining; part of the master program (XX); [T2] Madrid workshop on Phylogenetics (RJB-CSIC)...

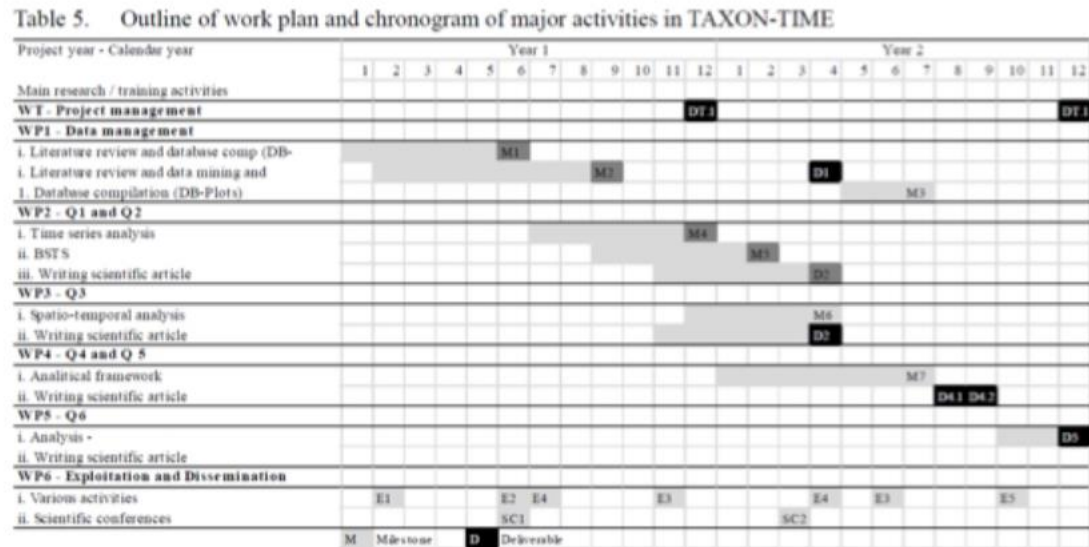
Dissemination [Dr] & Communication [Cr] – [Cr1] Project website... [Cr3] ER's participation in xx; [Dr1] Oral presentation at xx

Project Management [O] and Progress Monitoring [P] – [O1] Formal meeting with CSIC staff for implementation of MSCA grant; [O2] [P1] 40 min. e-meetings with xx [Pr1] Risk assessment report

4. Proposal

Implementation

YEAR 1 – Rejected



Weaknesses

- The **allocation of resources is presented in only a general manner and not discussed in sufficient detail.**



YEAR 2 – Approved

Strengths:

- Details of the work plan are coherent and effective; impressive **attention has been paid to these and to the description of the allocated tasks.**
- The work packages of the proposal are logically inter-related and he **Gantt Chart provides an excellent overview of the distribution of the work load for the researcher and collaborators.**
- The management structure is very good and includes coherent and effective progress monitoring to ensure delivery of the project objectives.
- Risks are very well identified and effective mitigation measures are proposed.
- The host and seconding / collaborating institutions have the necessary infrastructure, facilities and environment to enable the researcher to undertake the project successfully.

4. Proposal

- Layout

YEAR 1 – Rejected

TAXON-TIME – Standard EF

START PAGE COUNT – MAX 10 PAGES

1. EXCELLENCE¹

1.1 Quality and credibility of the research action

Initiatives to conserve biodiversity face a dilemma. They rely on species identities to justify political support and tend to consider species as static entities. However, this view ignores that species are reclassified following advances in taxonomic knowledge; thus, their names and descriptions are subject to a certain instability of change. Moreover, the unevenness of taxonomic knowledge across taxa and regions can affect the patterns of species diversity and our ability to, e.g., single out biodiversity hotspots^[1]. Despite its importance, conservation initiatives and taxonomic research still fail to explicitly account for the influence of an evolving taxonomic knowledge. This knowledge gap represents the primary focus of TAXON-TIME. To address it, TAXON-TIME will investigate the drivers of shifts in taxonomic knowledge over time and explore how these shifts affect our understanding of biodiversity.

Changes in species identity due to taxonomic reclassifications can arise from: (i) the inadvertent re-description of a species that had already been described (leading to nomenclatural problems), (ii) taxonomic reclassifications can merge previously different species into a single one (so-called lumping), or (iii) divide one species into two or more species (so-called splitting). Lumping and splitting of species affect the quality of biodiversity data^[2] and the effectiveness of conservation initiatives^[3]. Therefore, reclassification tags, species names should be considered standing hypotheses to be supported or refuted as new taxonomic knowledge becomes available.

The recent discoveries in the Brazilian flora can illustrate how continuous taxonomic reclassifications impact the number, identity and conservation status of species. Brazil is a record-breaker in the rate at which knowledge of flora is growing^[4]. New plant species discoveries are on a steady basis. Surprisingly, nearly 1500 new plant species have been seen in Amazonia, which has increased the number of described plant species in Brazil. Interestingly, the new descriptions come from mostly collected specimens, but 60% from the re-inspection of already existing herbarium vouchers. Hence half of the new species names added to the national species list belonged to known specimens that were reassigned to different taxa after being carefully re-inspected. In view of improving molecular techniques and phylogenetic analyses, it can be expected that taxonomic reclassifications change dramatically the identity and conservation status of plant species in Brazil^[5] and elsewhere as the development of a global trend where taxonomic reclassification advances our knowledge of the identity and existence of species^[6].

However, this trend challenges biodiversity science and conservation^[7]. Frequent reclassifications may weaken the empirical basis of conservation estimates and complicate estimations of the so-called Linnean shortfall (i.e. the gap between the number of formally described and yet-to-be discovered species^[8,9]) and thereby our ability to evaluate progress towards achieving conservation targets^[10]. If biodiversity conservation neglects changes in the taxonomy of species, it risks becoming ineffective^[11].

The problem could be addressed through an *a priori* identification of taxonomic and geographical regions for which future reclassifications are likely to impact our knowledge of the identity and existence of species^[12]. However, efforts in this direction are scarce to non-existent^[13], partly because the processes of describing species vary enormously between the natural and taxonomic cultures^[14]. The historical dynamics of taxonomic knowledge itself remains poorly understood except for a handful of taxonomic hotspots^[15].

Biodiversity scientists require powerful tools to trace the evolution of taxonomic knowledge through time and the inevitable uncertainty associated with currently accepted species names. The past decade has seen an explosion of species data available in digital global repositories^[16]. Big data and powerful open-source software tools offer access to a wealth of 400 million museum records^[17]. The quality and quantity of taxonomic coverage of these data can be now analysed with cutting edge statistical methods and computational tools^[18].

¹Papers from the host or the applicant are highlighted in bold. ^[1]Edeh et al. (2017) *PLoS* 114:3666. ^[2]Genoves et al. (2006) *Nature*, 444:93. ^[3]Hortal et al. (2015) *Ann Rev Ecol Syst*, 46:823. ^[4]Tedesco et al. (2017) *Ecol Evol*, 7:4868. ^[5]Matti & Mace (2007) *Plant Biol*, 5:1185. ^[6]Van Steege et al. (2016) *Sci Adv*, e1609036. ^[7]ICBN Royal Botanic Gardens (2016) *State of the World's Plants 2016*. ^[8]Singaret & Luksenberg (2015) *Divers Biol*, 64:144. ^[9]Nickelsson et al. (2012) *Science*, 317:1. ^[10]Balmer et al. (2010) *PLoS*, 10(2):169. ^[11]Beaman (2004) in *Frontiers of Biogeography: New Directions in the Geography of Nature*, ed. Lonozzo & Hamann, pp. 183. ^[12]Codrea (2016) *Plant Divers*, 38:10. ^[13]Gaston & Lees (2000) *Nature*, 404:25. ^[14]Fernex et al. (2017) *Conserv Biol*, 31:1111. ^[15]Beaman et al. (2017) *Nature Sci Rep*, 7:1. ^[16]Vences et al. (2015) *ZooKeys*, 556:201-244. ^[17]Soriano & Peterson (2004) *Phil Trans Roy Soc B*, 359:689. ^[18]Fritz (2015) *Ann Rev Ecol Syst*, 46:359. ^[19]OpenSci <https://opensci.org> (Accessed August 2017). ^[20]Hortal et al. (2007) *Conserv Biol*, 21:883. ^[21]Ladle & Hortal (2013) *Front Biogeogr*, 5:8. ^[22]Meyer et al. (2015) *Nat Comm*, 6:8221. ^[23]Strupp et al. (2016) *Global Ecol Biogeogr*, 25:1065. ^[24]Rocchini et al. (2017) *Sci Tot Environ*, 554-585:282.

YEAR 2 – Approved

START PAGE COUNT – MAX 10 PAGES

1 EXCELLENCE



1.1 QUIS NOSTRUD EXERCITATION ULLAMCO

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2 IMPACT



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3 IMPLEMENTATION



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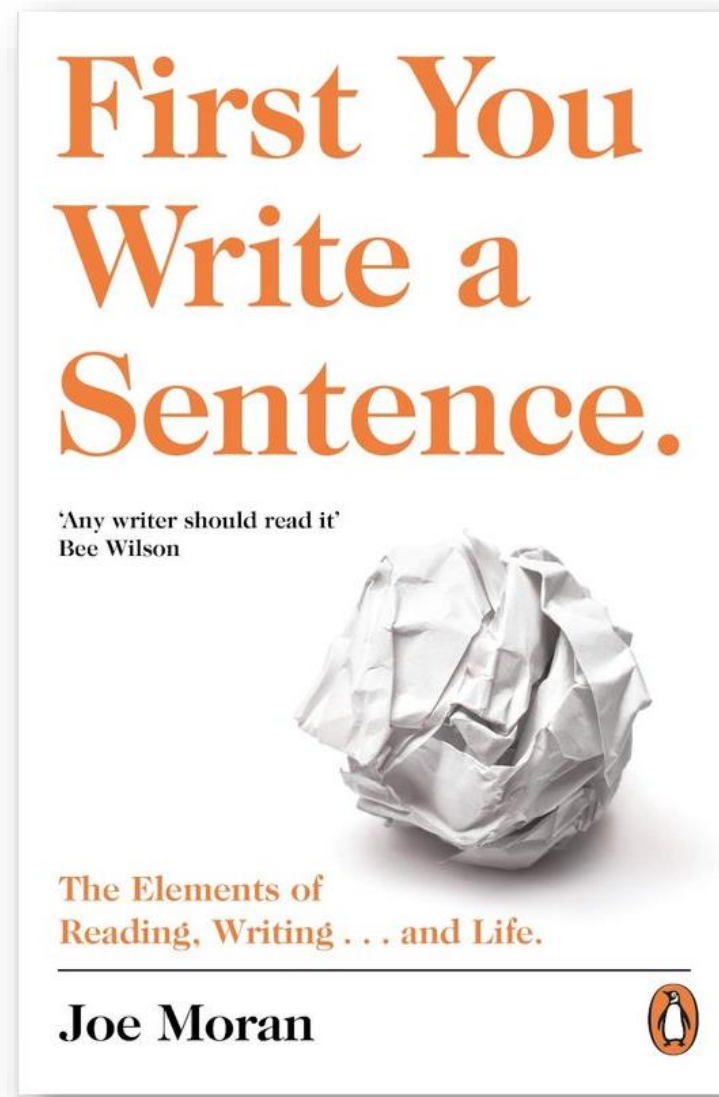
- Logo
- Colour
- Figures
- Tables
- Text in bold

5. Tipps for writing

- Acronyms should be easy to pronounce/remember
- Discuss your ideas, questions, and progress with colleagues (!!)
- Towards the end: many revisions and corrections with supervisor

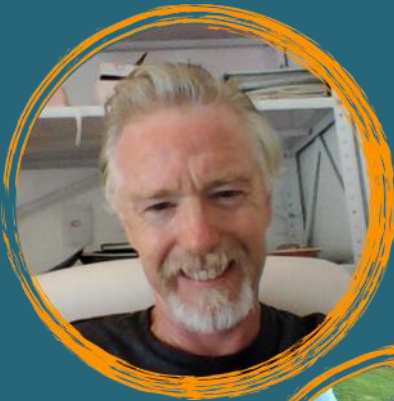
5. Tipps for writing

- “Learn to **love the full stop**
- **Vary the length** of your sentences
- Shorten your paragraphs
- Using mostly **short words** in a sentence has a happy side effect: a richer pattern of sounds
- When the **vowel sounds vary** and there are lots of stresses syllables, each word seems distinct from its neighbours. Every word counts
- ... fewer writers notice a **bigger problem: repeated sounds**
- Writing drifts into obscurity when it overuses a certain kind of abstract noun: a nominalization”.



Webinar

Preparing an application for a Marie Curie post-doctoral fellowship



Richard Ladle
ERA-Chair, Tropibio
@TropibioP



Juliana Stropp
MSCA fellow, TAXON-TIME
@taxon_time



TROPIBIO

TAXON-TIME



Thank you!

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