Training plan

1. Training courses

- Workshop: Introduction to Bayesian inference in practice, Live Online Course 8th Edition. Expected in May 2024. Organized by <u>Transmitting Science</u>. Instructors: Daniele Silvestro and Tobias Andermann.
- Support obtained from the free tutorials prepared to explain the use of the software PyRate prepared by Daniele Silvestro from https://github.com/dsilvestro/PyRate.

2. Research stays

- University of Gothenburg, Sweden (3 months). Training and familiarization in the use of software and Bayesian modelling applied to evolutionary biology. Responsible: Daniele Silvestro.
- Institut des Sciences de l'Evolution de Montpellier, France (3 months). Formation on integrative approach mixing phylogenetics, paleontology, ecology, species traits, and paleoclimate to understand the onset of deep-time organisms richness patterns. Responsible: Fabien L. Condamine.

3. Conference attendance

- ICE2024 XXVII International Congress of Entomology, Kyoto, Japan (August 25th–30th 2024).
- Evolution, Athens, Greece (June 20th–24th 2025).
- SEP 2025 Jornadas de la Sociedad Española de Paleontología, to specify (2025)
- ICE2026 XXVIII International Congress of Entomology, to specify (2026)

4. Expected results

As the results are analyzed, the student will be encouraged to take the initiative in discussing them and writing scientific papers that we plan to publish in high impact journals.

At least three publications are expected: a main result estimating correlations between beetle diversification dynamics and multiple environmental variables, and two more specific analysis of parameters of paleoecological importance (i) the beetle-plant relationship in the fossil record and (ii) the evolution of pollinator behavior in Coleoptera.

5. Day-to-day supervision

The supervisor/researcher interactions for the day-to-day work will include a weekly meeting to share new information, to help solve difficulties and provide guidance. A monthly progress monitoring meeting will allow a more in-depth discussion of the project development, evaluation of the planned research and the pursuit of the objectives. In addition, a virtual meeting with Dr. Condamine every month will complete the support needed for this project plan.

6. Timetable

		Year											
	Description	2024				2025				2026			
	Description	1	2	3	4	1	2	3	4	1	2	3	4
Objective 1	Lear about Coleoptera												
To update the fossil	Learn about fossils												
beetle dataset	Bibliographic search of fossil beetles												
Objective 2	Bibliographic search												
To complement the fossil beetle dataset	Complete dataset												
Objective 3	Run analyses												
To perform	Analyze results												
Bayesian analyses	Adjust parameters												
Objective 4	Design new analyses												
To perform more	Bibliographic search												
specific analysis	Complete dataset												
about paleoecology	Run analyses												
	Analyze results												
	Adjust parameters												
Training	Course Transmitting Science												
	Learn PyRate												
Stays	Stay 1 Sweden (Daniele Silvestro)												
	Stay 2 France (Fabien Condamine)												
Conferences	ICE 2024 (International)												
	Evolution 2025 (International)												
	SEP 2025 (National)												
	ICE 2026 (International)												
Synthesis and	Manuscript 1												
publications	Manuscript 2												
	Manuscript 3												
	PhD Thesis												