

Curriculum Vitae

Aurèle TOUSSAINT

Researcher CNRS

Date of birth: 16th of July 1988

Nationality: French

Professional address:

Centre de Recherche pour la Biodiversité et l'Environnement (CRBE)

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Professional appointments

January 2020 – December 2023: Research fellow

Research done at the Institute of Ecology and Earth Sciences, Department of Botany (University of Tartu, Estonia)

Supported by the Estonian Research Council

PSG-505: Toward an optimization of the functional diversity approaches of freshwater fish: historical patterns and impact of human activities.

Rank: 1/42

260.500,00 EUR

September 2017 – August 2019: MOBILITAS Pluss Post-Doctoral researcher

Research done at the Institute of Ecology and Earth Sciences, Department of Botany (University of Tartu, Estonia)

Supported by the Estonian Research Council

MOBJD-276: Macroecology of functional diversity: comparison of taxonomic groups.

Rank: 1/106

63.300,00 EUR

Evolved in the project: *IUT20-29: Dark diversity: taxonomic, phylogenetic, functional and genetic levels in dynamic plant communities.*

September 2016 – August 2017: Specialist fellow in MacroEcology

Research done at the Institute of Ecology and Earth Sciences, Department of Botany (University of Tartu, Estonia)

Evolved in the project: *IUT20-29: Dark diversity: taxonomic, phylogenetic, functional and genetic levels in dynamic plant communities.*

January 2016 – June 2016: Erasmus-Mundus mobility grant for PhD Student

Research done at the Kyung Hee University – Dept of Biology – Seoul, Korea

Supervisor: Pr. Young-Seuk Park (Kyung-Hee University)

October 2012 – June 2016: PhD Student in Fish Macro-ecology

Research done at the Laboratory 'Evolution & Diversité Biologique' (University Paul Sabatier – Toulouse 3 UMR 5174)

Topic: Functional diversity of freshwater fish fauna at the world scale: patterns, determinants and human activities impacts

Supervisors: Pr. Sébastien Brosse (University Paul Sabatier) and Dr. Sébastien Villéger (University Montpellier 2)

October 2013 – June 2015: Teaching assistant in biostatistics at the University Paul Sabatier – Toulouse 3.**Education****2011-2012: Second year of Master of Science (MSc) in Biostatistics and ecological systems modelling** University Paul Sabatier-Toulouse 3, France – With second highest distinction (Rank: 5/19)

Thesis done at the Laboratory 'Evolution & Diversité Biologique' (UMR 5174) supervised by Sébastien Brosse and Sébastien Villéger.

Topic: Determinants of change in taxonomic dissimilarity in the freshwater fish fauna at the world scale

2010-2011: First year of Master of Science (MSc) in Ecology at the University Paul Sabatier-Toulouse 3, France – With distinction (Rank: 43/172)

Thesis done at the Laboratory 'Evolution & Diversité Biologique' (UMR 5174) supervised by Sébastien Brosse and Simon Blanchet.

Topic: Revision of the taxonomy of the freshwater fish European fauna and implications for conservation and biogeography.

2008-2010: Bachelor of Science (BSc) in Biology of Organisms University of Lorraine, Nancy, France (Rank: 90/237)

2009, July: **Thesis** done at the 'Département d'Ecologie, Physiologie et Ethologie' (UMR 7178 DEPE) supervised by Pr. M. Trabalon & Dr. C. Gilbert.

Topic: Sexual behaviour of the rats in a choosing situation

2006-2007: 'PCEM1': First Year of the medical studies University of Lorraine in Nancy, France (Rank for the competitive examination: 888/1959)**2006: 'Baccalauréat' of Sciences** (Equivalent to A-Level)**Scientific communications****Article in international peer-reviewed journals**

* Co-senior authorship

26. Coulon N., Pilet S., Lizé A., Lacoue-Labarthe T., Sturbois A., **Toussaint, A.**, Feunteun E., Carpentier A. Shark critical life stage vulnerability to monthly temperature variations under climate change. ***Marine Environmental Research***, 198, 106531.
25. Tordoni, E., Carmona, C. P., **Toussaint, A.**, Tamme, R., & Pärtel, M. Global patterns and determinants of multiple facets of plant diversity. ***Global Ecology and Biogeography***, 00, e13823.
24. **Toussaint A.**, Pärtel M., Carmona C.P., Contrasting impacts of non-native and threatened species on morphological, life-history, and phylogenetic diversity in bird assemblages, ***Ecology Letters***, 27, e14373
23. **Toussaint A.**, Pärtel M., Carmona C.P., Contrasting impacts of non-native and threatened species on morphological, life-history, and phylogenetic diversity in birds' assemblages, ***Authorea***
22. Coulon, N., Lindegren, M., Goberville, E., **Toussaint, A.**, Receveur, A., and Auber, A., Threatened fish species in the Northeast Atlantic are functionally rare. ***Global Ecology and Biogeography***, 00, 1–19.
21. Bueno, C.G., **Toussaint, A.**, Träger, S. et al. Reply to: The importance of trait selection in ecology. ***Nature***, 618, E31–E34.
20. **Toussaint A.**, Pärtel M., Carmona C.P., Non-native bird species will not compensate for the loss of phylogenetic and functional diversity after the extinction of threatened species, ***Authorea***
19. de Tombeur, F., Raven, J. A., **Toussaint A.**, Lambers, H., Cooke, J., Hartley, S. E., Johnson, S. N., Coq, S., Katz, O., Schaller, J. and Violle, C., Why do plants silicify? ***Trends in Ecology and Evolution***, 38(3), 275-288.
18. Auber A., Waldock C., Maire A., Goberville E., Albouy C., Algar A.C., McLean M., Brind'Amour A., Green A.L., Tupper M., Vigliola L., Kaschner K., Kesner-Reyes K., Beger M., Tjiputra J, **Toussaint A.**, Violle C., Mouquet N., Thuiller W., Mouillot D., A functional vulnerability framework for biodiversity conservation, ***Nature Communications***, 13, 4774.
17. Paganeli B., **Toussaint A.**, Bueno C. G., Fujinuma J., Reier Ü., Pärtel M., Dark diversity at home describes the success of cross-continent tree invasions. ***Diversity and Distributions***, 28 (6), 1202-1213.
16. Su G., Tedesco P.A., **Toussaint A.**, Villegger S., Brosse S., Contemporary environment and historical legacy explain functional diversity of freshwater fishes in the world rivers, ***Global Ecology and Biogeography***. 31, 700-713.
15. Brosse S., Charpin N., Su G., **Toussaint A.**, Herrera-R. G.A., Tedesco P.A., Villegger S., FISHMORPH: A global database on morphological traits of freshwater

- fishes, *Global Ecology and Biogeography*, 30 (12), 2330-2336.
14. Carmona C.P., Bueno C.G., **Toussaint A.**, Träger S., Diaz S., Moora M., Munson D.A., Pärtel M., Zobel M., Tamme R., Fine-root traits in the global spectrum of plant form and function, *Nature*, 597 (7878), 683-687.
 13. **Toussaint A.**, Brosse S., Bueno C.G., Pärtel M., Tamme S., Carmona C.P., Extinction of threatened vertebrates will lead to idiosyncratic changes in functional diversity across the world, *Nature Communication*, 12 (1), 1-12.
 12. Tordoni E., **Toussaint A.**, Pärtel M., Nogues-Bravo D., Carmona C.P., Combining taxonomic, phylogenetic and functional diversity reveals new global priority areas for tetrapod conservation, *bioRxiv*, doi: <https://doi.org/10.1101/2021.07.01.450689>
 11. Carmona C.P., Tamme R., Pärtel M., de Bello F., Brosse S., Capdevila P., Gonzalez-M R., Gonzalez-Suarez M., Salguero-Gomez R., Vasquez-Valderrama M., **Toussaint A.** Erosion of global functional diversity across the tree of life, *Science Advances*, 7(13), eabf2675.
 10. Carmona C.P., Tamme R., Partel M., de Bello F., Brosse S., Capdevila P., Gonzalez-M R., Gonzalez-Suarez M., Salguero-Gomez R., Vasquez-Valderrama M., **Toussaint A.** Mapping extinction risk in the global functional spectra across the tree of life, *bioRxiv*, doi: <https://doi.org/10.1101/2020.06.29.179143>
 9. Derezal, O., Mondy P.C., Dembski S., Kreutzenberger K., Reyjol Y., Chanderis A., Valette L., Brosse S., **Toussaint A.**, Beillard J., Merg M.L., Usseglio-Polatera P. A diagnostic-based approach to assess specific risks of river degradation in a multiple pressure context: Insights from fish communities. *Science of The Total Environment*, 734, 139467.
 8. **Toussaint A.**, Bueno G., Davison J., Moora M., Tedersoo L., Zobel M., Opik M. & Partel M. *Journal of Vegetation Science*, 31(2), 355-366.
 7. **Toussaint A.**, Charpin N., Villéger S.* & Brosse S.* Worldwide freshwater fish homogenization is driven by few widespread non-native species. *Ecology Letters* 21(11), 1649-1659
 6. Kuczynski L., Côte J., **Toussaint A.**, Brosse S., Buisson L., Grenouillet G. (2018) Spatial mismatch in morphological, ecological and phylogenetic diversity, in historical and contemporary European freshwater fish faunas. *Ecography* 41:1665-1674.
 5. Tedersoo L., Laanisto L., Rahimlou S., **Toussaint A.**, Hallikma T., Pärtel M. (2018) Global database of plants with root-symbiotic nitrogen fixation: Nod DB. *Journal of Vegetation Science* 10:560-568
 4. **Toussaint A.**, Charpin N., Brosse S.* & Villéger S.* Global functional diversity of

freshwater fish is concentrated in the Neotropics. 2016. **Scientific Report** 6: 22125.

3. **Toussaint A.**, Beauchard O., Oberdorff T., Brosse S. & Villeger S. Worldwide freshwater fish homogenization is driven by a few widespread non-native species. 2016. **Biological Invasions** 18: 1295–1304.
2. Allard L., **Toussaint A.**, Vigouroux R. & Brosse S. Length-weight relationship of 58 fish species in streams of French Guiana. 2015. **Journal of Applied Ichthyology** 31: 567-570.
1. **Toussaint A.**, Beauchard O., Oberdorff T., Brosse S. & Villeger S. 2014. Historical assemblage distinctiveness and the introduction of widespread non-native species explain worldwide changes in freshwater fish taxonomic dissimilarity. **Global Ecology and Biogeography** 23:574–584.

Oral presentations

7. **Toussaint A.**, Partel M., Carmona C.P., Contrasting impacts of non-native and threatened species on morphological, life-history, and phylogenetic diversity in bird assemblages. **Annual meeting for macroecology of the ecological society of Germany Austria and Switzerland, Marburg** (Germany). 2024, June.
6. Carmona C.P., Tamme R., Partel M., de Bello F., Brosse S., Capdevila P., Gonzalez-M R., Gonzalez-Suarez M., Salguero-Gomez R., Vasquez-Valderrama M., **Toussaint A.**, Mapping extinction risk in the global functional spectra across the tree of life. **Annual meeting for macroecology of the ecological society of Germany Austria and Switzerland, Konstanz** (Germany). 2020, April.
5. **Toussaint, A.**, Pärtel M. Global mismatch between the species richness of vascular plants and symbiosis fungi across biogeographic realms. **Annual meeting for macroecology of the ecological society of Germany Austria and Switzerland, Birmendorf** (Switzerland). 2018, April.
4. **Toussaint, A.**, Pärtel M. Global mismatch between the species richness of vascular plants and symbiosis fungi across biogeographic realms. **60th IAVS Annual Symposium**. Palermo (Italy). 2017, June.
3. **Toussaint, A.**, Charpin, N., Brosse, S., Villéger, S. Functional diversity and vulnerability of freshwater fish at the global scale. **7th EAFES International Congress**. Daegu (Korea). 2016, April.
2. **Toussaint, A.**, Charpin, N., Brosse, S., Villéger, S. Introductions of non-natives freshwater fish affected differently the taxonomic and functional biodiversity facets. **9th Symposium for European freshwater sciences**. Geneva (Switzerland). 2015, July
1. **Toussaint, A.**, Beauchard, O., Oberdorff, T., Brosse, S., Villéger, S. Historical assemblage distinctiveness and the introduction of widespread non-native species

explain worldwide changes in freshwater fish taxonomic dissimilarity. **8th Symposium for European freshwater sciences.** Munster (Germany). 2013, July

Poster

1. **Toussaint, A.**, Charpin, N., Brosse, S., Villéger, S. Functional diversity of the freshwater fish fauna. **7th Biennial conference of the International Biogeography Society.** Bayreuth (Germany). 2015, January

Teaching

Teaching assistant (2013-2015), University Paul Sabatier – Toulouse 3 – France

Ecology & Quantitative Biology (BSc degree)
Biostatistics (BSc degree)
Multivariate analyses (MSc degree)

Teaching assistant (2019-2023), University of Tartu, Estonia

Data analysis in community ecology (BSc-, MSc-, PhD-students)

Student supervision

Adrien Solacroup. **Master.** January to April 2014. *Characterization of the morphological intra specific variability on the French Guyana and European freshwater fish community.*

Languages

French: mother tongue

English: excellent command/fluent

Italian: basic communication skills

Skills

- Office software (*Windows/Linux/Mac*)
- Statistical analyses, function programming and high level graphics *R*
- Good knowledge in GIS (*ArcGIS*)
- Image processing
- Driving licence