Curriculum Vitae

Aurèle TOUSSAINT

PhD

Date of birth: 16th of July 1988

Nationality: French

Professional address:

Institute of Ecology and Earth Sciences
Department of Botany
University of Tartu
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Current position

January 2020 – Present: 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

Professional appointments

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

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.**, Villeger 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., Villeger 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

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 Biennal 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-present), 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.*

Anne Merzin. **PhD student.** September 2020 – present. *Functional diversity of freshwater fish in Estonia: Historical patterns and influence of human activities.*

Scientific activities

Reviewer for international peer-reviewed journals

International Journal of Biodiversity and Conservation; Biological Journal of the Linnean Society; Hydrobiologia; Ecology; Scientific Report; New Phytologist

Languages

French: mother tongue
English: excellent command
German: basic communication skills
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