LEBRUN Manhattan

Née le 29 janvier 1992

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FORMATION

2016-2019: Thèse de doctorat en biologie environnementale à l'Università degli Studi del Molise, (Italie) en collaboration avec l'Université d'Orléans (France)

Sujet: Biogeochemical and microbiological processes involved in the rhizospheric area of *Salicaceae* grown on an amended technosol polluted by inorganic toxic elements: a phytostabilization study.

Encadrants: Dr Domenico MORABITO, Dr Sylvain BOURGERIE et Pr Gabriella Stefania SCIPPA

Aout 2017 : Ecole d'été au sein du Laboratoire Interdisciplinaire des Environnements Continentaux à Vandoeuvre-les-Nancy:

Thème : Functions of soil microbial communities: impact of anthropization.

2015: Semestre en Erasmus à l'Université de Zagreb (Croatie).

2014-2016: Master en Sciences à l'Université d'Orléans (France).

Spécialité: Biologie des Organismes, Populations et Ecosystèmes

2011-2014:Licence en Sciences à l'Université d'Orléans (France).

Spécialité: Biologie des Organismes, Populations et Ecosystèmes

EXPERIENCE PROFESSIONNELLE

ENSEIGNEMENT

2016-2020: Vacataire à l'Université d'Orléans (France).

Travaux pratiques dispensés à des étudiants de première année de Licence en biodiversité et biologie des plantes

Travaux dirigés et travaux pratiques dispensés à des étudiants en première année de Master en écotoxicologie and phytoremédiation.

Travaux pratiques dispensés à des étudiants en première année de Licence en biocimie.

LABORATOIRE

Avril 2020 : post-doctorat de 17 mois au sein du Laboratoire de Biologie des Ligneux et des Grandes Cultures (LBLGC) de l'Université d'Orléans (France).

Sujet : APR IR BioFeril (Utilisation de BIOchar pour améliorer et optimiser l'apport de FERTILisants en zones vulnérables).

Décembre 2019 – Mars 2020 : Ingénieure d'étude au sein du Laboratoire de Biologie des Ligneux et des Grandes Cultures (LBLGC) de l'Université d'Orléans (France).

Sujet : Association d'amendements, de microorganismes et de plantes pour la remédiation de sites miniers fortement contaminés par des éléments traces métalliques.

Novembre 2018 - Mai 2019: Stage de 6 mois dans le cadre du doctorat au sein du laboratoire Ecochem, à l'Université de Gand (Belgique).

Sujet: Evaluation of the effect of several biochars and redmuds, applied alone or in combination, on Pb immobilization, Salix growth and Pb accumulation ability.

Encadrant: Pr Filip TACK

Février - Juillet 2016: Stage au sein du LBLGC Laboratoire de Biologie des Ligneux et des Grandes Cultures (LBLGC) de l'Université d'Orléans (France).

Sujet: Eco-restauration d'un technosol minier par l'application de biochar et la mise en place de plants de saules: études des propriétés physico-chimiques du sol et des capacités phytostabilisatrices de *Salix viminalis*.

Encadrant : Dr Sylvain BOURGERIE.

Avril - Juin 2015: Stage au sein du LBLGC Laboratoire de Biologie des Ligneux et des Grandes Cultures (LBLGC) de l'Université d'Orléans (France).

Sujet: "Saules et phytoremédiation".

Encadrant : Dr Domenico MORABITO

Mars 2014: Stage au sein du LBLGC Laboratoire de Biologie des Ligneux et des Grandes Cultures (LBLGC) de l'Université d'Orléans (France).

Sujet: "Effet de la densité de semis sur la croissance du peuplier noir (*P. nigra*) "

Encadrant : Cécile VINCENT-BARBAROUX

TRAVAIL SCIENTIFIQUE

Publications dans des revues internationales

16- Hattab-Hambli, N., Lebrun, M., Miard, F., Le Forestier, L., Bourgerie, S., & Morabito, D. (2020). Preliminary Characterization of a Post-Industrial Soil for Long-Term Remediation by Phytomanagement: Mesocosm Study of Its Phytotoxicity Before Field Application. International Journal of Environmental Research, 1-13.

15- Simiele, M., Lebrun, M., Miard, F., Trupiano, D., Poupart, P., Forestier, O., Scippa, G. S., Bourgerie, S. & Morabito, D. (2020). Assisted phytoremediation of a former mine soil using biochar and iron sulphate: Effects on As soil immobilization and accumulation in three Salicaceae species. Science of The Total Environment, 710, 136203.

14- Lebrun, M., Miard, F., Hattab-Hambli, N., Scippa, G. S., Bourgerie, S., & Morabito, D. (2020). Effect of different tissue biochar amendments on As and Pb stabilization and phytoavailability in a contaminated mine technosol. Science of The Total Environment, 707, 135657.

13- Lebrun, M., De Zio, E., Miard, F., Scippa, G. S., Renzone, G., Scaloni, A., Bourgerie, S., Morabito, D. & Trupiano, D. (2020). Amending an As/Pb contaminated soil with biochar, compost and iron grit: effect on Salix viminalis growth, root proteome profiles and metal (loid) accumulation indexes. Chemosphere, 244, 125397.

12- Van Poucke, R., Egene, C. E., Allaert, S., Lebrun, M., Bourgerie, S., Morabito, D., Ok, Y. S., Ronsse, F., Meers, E. & Tack, F. M. (2019). Application of biochars and solid fraction of digestate to decrease soil solution Cd, Pb and Zn concentrations in contaminated sandy soils. Environmental geochemistry and health, 1-12.

11- Nandillon, R., Lebrun, M., Miard, F., Gaillard, M., Sabatier, S., Morabito, D., & Bourgerie, S. (2019). Contrasted tolerance of Agrostis capillaris metallicolous and non-metallicolous ecotypes in the context of a mining technosol amended by biochar, compost and iron sulfate. Environmental geochemistry and health, 1-19.

10- Nandillon, R., Miard, F., Lebrun, M., Gaillard, M., Sabatier, S., Bourgerie, S., Battaglia-Brunet, F & Morabito, D. (2019). Effect of biochar and amendments on Pb and As phytotoxicity and phytoavailability in a technosol. CLEAN–Soil, Air, Water, 47(3), 1800220.

9- Nandillon, R., Lahwegue, O., Miard, F., Lebrun, M., Gaillard, M., Sabatier, S., Battaglia-Brunet, F., Morabito, D. & Bourgerie, S. (2019). Potential use of biochar, compost and iron grit associated with Trifolium repens to stabilize Pb and As on a multi-contaminated technosol. Ecotoxicology and environmental safety, 182, 109432.

8- Nandillon, R., Lebrun, M., Miard, F., Gaillard, M., Sabatier, S., Villar, M., Bourgerie, S. & Morabito, D. (2019). Capability of amendments (biochar, compost and garden soil) added to a mining technosol contaminated by Pb and As to allow poplar seed (Populus nigra L.) germination. Environmental monitoring and assessment, 191(7), 465.

7- Lebrun, M., Miard, F., Nandillon, R., Scippa, G. S., Bourgerie, S., & Morabito, D. (2019). Biochar effect associated with compost and iron to promote Pb and As soil stabilization and Salix viminalis L. growth. Chemosphere, 222, 810-822.

6- Lebrun, M., Miard, F., Renouard, S., Nandillon, R., Scippa, G. S., Morabito, D., & Bourgerie, S. (2018). Effect of Fe-functionalized biochar on toxicity of a technosol contaminated by Pb and As: sorption and phytotoxicity tests. Environmental Science and Pollution Research, 25(33), 33678-33690.

5- Lebrun, M., Miard, F., Hattab-Hambli, N., Bourgerie, S., & Morabito, D. (2018). Assisted phytoremediation of a multi-contaminated industrial soil using biochar and garden soil amendments associated with Salix alba or Salix viminalis: abilities to stabilize As, Pb, and Cu. Water, Air, & Soil Pollution, 229(5), 163.

4- Lebrun, M., Miard, F., Nandillon, R., Léger, J. C., Hattab-Hambli, N., Scippa, G. S., Bourgerie, S. & Morabito, D. (2018). Assisted phytostabilization of a multicontaminated mine technosol using biochar amendment: Early stage evaluation of biochar feedstock and particle size effects on As and Pb accumulation of two Salicaceae species (Salix viminalis and Populus euramericana). Chemosphere, 194, 316-326.

3- Lebrun, M., Miard, F., Nandillon, R., Hattab-Hambli, N., Scippa, G. S., Bourgerie, S., & Morabito, D. (2018). Eco-restoration of a mine technosol according to biochar particle size and dose application: study of soil physico-chemical properties and phytostabilization capacities of Salix viminalis. Journal of Soils and Sediments, 18(6), 2188-2202.

2- Lomaglio, T., Hattab-Hambli, N., Miard, F., Lebrun, M., Nandillon, R., Trupiano, D., Scippa, G.S., Gauthier, A., Motelica-Heino, M., Bourgerie, S. & Morabito, D. (2018). Cd, Pb, and Zn mobility and

(bio) availability in contaminated soils from a former smelting site amended with biochar. Environmental Science and Pollution Research, 25(26), 25744-25756.

1- Lebrun, M., Macri, C., Miard, F., Hattab-Hambli, N., Motelica-Heino, M., Morabito, D., & Bourgerie, S. (2017). Effect of biochar amendments on As and Pb mobility and phytoavailability in contaminated mine technosols phytoremediated by Salix. Journal of Geochemical Exploration, 182, 149-156.

Communications orales

Biochar II (Calabre, Italie): Immobilization of heavy metal in contaminated mine technosols using biochar: a phytomanagement strategy. Morabito D, Lebrun M, Nandillon R, Hattab-Hambli N, Chevolleau S, Miard F, Simiele M, Bourgerie S.

BEEM2019 (Hong-Kong): Biochar: an effective amendment to reduce soil pollution and for the implementation of phytomanagement strategies. Lebrun M, Nandillon R, Haatab-Hambli N, Chevolleau S, Garraud J, Tuffigo S, Miard F, Simiele M, Bourgerie S, Morabito D.

SUITMA10 (Seoul, Korea): Effect of hardwood biochar and endogen *Bacillus* inoculation on *Salix viminalis* growth and pollutant immobilization of an As and Pb contaminated former mine technosol. Lebrun M, Miard F, Nandillon R, Trupiano D, Bucci A, Scippa GS, Bourgerie S, Morabito D

ICEPR2018 (Madrid, Espagne):
Biochar amendment associated to compost and/or iron in order to improve lead and arsenic soil stabilization and *Salix viminalis* growth. Lebrun M, Miard F, Nandillon R, Trupiano D, De Zio E, Scippa GS, Bourgerie S, Morabito D. (BEST PAPER AWARD)
Phytotoxicity test to assess biochar associated to others amendments effect on Pb and As from mining technosol. Nandillon R, Lebrun M, Miard F, Gaillard M, Sabatier S, Bourgerie S, Battaglia-Brunet F, Morabito D.
Biochar obtained from different wood trunk layers allow to stabilize Pb and As in a mining technosol. Chevolleau S, Beaumont F, Miard F, Lebrun M, Nandillon R, Gautret P, Léger JC, Bourgerie S, Morabito D.
Poplar Seeds Capabilities to Germinate on a Metal(loid)s Contaminated Mining Technosol Differently Amended. Miard F, Nandillon R, Lebrun M, Gaillard M, Sabatier S, Bourgerie S, Morabito D.
Capabilities of Fe-Functionalized Biochar to Decrease Soil Pb and As Phytodisponibility. Lebrun M, Miard F, Renouard S, Nandillon R, Scippa GS, Morabito D, Bourgerie S.

Global Symposium on soil Pollution 2018 (Rome, Italie) : Biochar an efficient tool to decrease Pb and As in metal(loid)s contaminated soils and to allow assisted phytoremediation of multicontaminated technosols using tree species. Lebrun M, Nandillon R, Hattab-Hambli N, Miard F, Scippa G.S., Bourgerie S, Morabito D.

GRS-DIBT 2018 (Isernia, Italie): Does biochar associated to compost and iron allow a better Pb and As soil stabilization and tree growth? Lebrun M, Miard F, Nandillon R, Truppiano D, DeZio E, Scippa GS, Bourgerie S, Morabito D

14th International Phytotechnologies Conference 2017 (Montréal, Canada): Effect of lightwood and pinewood biochar amendments on the growth and assisted phytostabilizing capacities of Salix viminalis Lebrun M, Miard F, Nandillon R, Léger JC, Scippa GS, Morabito D, Bourgerie S .

French Flax Research Network Meeting 2017 (Amiens, France): Quel est le potentiel du lin en phytoremédiation assistée ? Etude exploratoire de l'effet d'un amendement au biochar sur les capacités phytoremédiatrices de 5 cultivars de lin placés sur un ancien site minier présentant une pollution polymétallique. Lebrun M, Miard F, Drouet S, Renouard S, Hano C, Laine E, Morabito D, Bourgerie S.

Ecology 2017 (Kayseri, Turquie): Use of biochar obtained from wood feedstock to reduce lead contamination in mining soil, effect on *Ailanthus altissima* growth and lead plant accumulation. Morabito D, Alidou-Arzika I, Lebrun M, Miard F, Nandillon R, Lahwegue O, Léger JC, Bourgerie S, Bayçu G.

3rd Asia Pacific Biochar Conference (Corée du Sud):
Organic amendments effects on the physicochemical characteristics of a contaminated soil and on the growth of three willow species in a phytoremediation goal. Lebrun M, Macri C, Hattab-Hambli N, Miard F, Motelica-Heino M, Lomaglio T, Scippa GS, Bourgerie S, Morabito D.
Effects of different biochars as amendments on the physicochemical characteristics of a contaminated soil and on the growth of *S. viminalis* in a phytoremediation end. Lebrun M, Macri C, Hattab-Hambli N, Miard F, Motelica-Heino M, Leger JC, Bourgerie S, Morabito D.

International Conference of Heavy Metals in the Environment 2016 (Ghent, Belgique): Effect of organic amendments to improve the physicochemical characteristics of a soil and to enhance the growth of three willow species. Lebrun M, Macri C, Hattab-Hambli N, Miard F, Minuto L, Motelica-Heino M, Bourgerie S, Morabito D.

Eurosoil 2016 (Istanbul, Turquie): Effects of biochar and garden soil as amendments on the physicochemical characteristics of contaminated soils and on the growth and the potential use of 6 *Salix* species for phytoremediation. Lomaglio T, Lebrun M, Hattab-Hambli N, Miard F, Cottard F, Gaillard M, Sabatier S, Motelica-Heino M, Bourgerie S, Morabito D.

Posters

4th Edition of Global COnference on Plant Science and Molecular Biology (Londres, Angleterre): The effect of bioaugmentation and biochar-stimulation on metal(loid)s contaminated soil and plant growth. Simiele M, Bucci A, Lebrun M, Scippa GS, Bourgerie S, Morabito D, Naclerio G, Trupiano D.

Sites et Sols Pollués 2019 (Paris, France) : Phytomanagement d'un technosol minier : Etude des effets d'amendements et d'un couvert végétal sur la biodisponibilité de l'As et du Pb. Nandillon R, Lebrun M, Miard F, Gaillard M, Sabatier S, De Lary De Latour L, Battaglia-Brunet F, Morabito D, Bourgerie S.

AFEM2019 (Bussang, France): Effet de trois amendements (biochar, compost, grenaille de fer), seuls ou combinés, sur l'activité et la diversité microbienne d'un ancien sol minier pollué à l'arsenic et au plomb. Lebrun M, Miard F, Scippa GS, Morabito D, Bourgerie S.

GRS-DIBT 2017 (Isernia, Italie): Biochar functionalization to improve As sorption capacity and utilization for mine technosol technosol stabilization: phytotoxicity test using *P. vulgaris.* Lebrun M, Nandillon R, Miard F, Alidou-Arzika I, Hattab-Hambli N, Bourgerie S, Morabito D and Scippa GS.

International Conference on Heavy Metals in the Environment 2016 (Ghent, Belgique): Effect of a biochar amendment to improve the physicochemical characteristics of a former mine extraction soil

contaminated mainly by Pb and As and to enhance the growth of three willow species. Bourgerie S, Macri C, Lebrun M, Hattab-Hambli N, Miard F, Motelica-Heino M, Morabito D.

Biotechnocentre 2016 (Seillac, France): Effects of a biochar amendment to improve the physico-chemical characteristics of a former mine extraction soil contaminated mainly by Pb and As and to enhance the growth of three willow species. Lebrun M, Macri C, Hattab-Hambli N, Miard F, Motelica-Heino M, Bourgerie S and Morabito D.

INFORMATIONS COMPLEMENTAIRES

Logiciel informatique (Word, PowerPoint, Excel), logiciel statistique (R)
Anglais: CLES 2, TOEIC (score : 925)

REFERENCES

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Dr Sylvain BOURGERIE, Université d'Orléans: sylvain.bourgerie@univ-orleans.fr
Pr Gabriella Scippa, Università del Molise : scippa@unimol.it