Annex 1. Details of Supervisors Eligible for the GRE/FAPESP/USP PPGSHS 2018 Full PhD Selection

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Edson C. Wendland
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2015/03806-1
FAPESP Contract Period: 01/04/2016 a 31/03/2021
FAPESP Project: Water availability and quality threats in a Guarani Aquifer System outcrop zone
PPGSHS/EESC-USP Research Field: Groundwater Hydrology & Water Resources

Summary of FAPESP Research Project: The Guarani Aquifer System (GAS) is one of the most important transboundary aquifers in the world. Located in parts of four South America countries (Argentina, Brazil, Paraguay and Uruguay), its area is estimated to 1.2 Million km². The GAS is formed by the eolian sandstones of the Jurassic (Botucatu formation) and fluvio-eolian Triassic (Pirambóia formation) periods. In Brazil 1,443 municipalities are located in the SAG area (BORGHETTI, 2004), with growing water demand for urban, industrial and agricultural purposes. Due to the strategic, social and economic importance of this aquifer for the four countries, it is necessary to understand its replenishment. The majority of recharge to the aquifer is hypothesized to occur in the outcrop areas, where the GAS appears as an unconfined aquifer. However few hydrogeologic studies focusing this question are available. The present project is compound of three major foci: 1. A monitoring network installed in the Ribeirão da Onça watershed aiming to understand and quantify the recharge mechanisms at these outcrop areas. A complete water balance can be evaluated, leading to the estimation of the main components of the hydrologic cycle (e.g., precipitation, evapotranspiration, storage, base flow) under agricultural use. The influence of different land uses (e.g. eucalyptus, sugar cane, citrus and grassland) can be quantified. 2. An experimental site under undisturbed dense Cerrado in order to understand pre-deforestation conditions. Canopy interception, throughfall, stemflow, surface runoff, erosion, and water table level are obtained, allowing the evaluation of the impact of soil use changes in comparison to native vegetation. 3. A monitoring network in an abandoned landfill aiming to the evaluation of contamination and transport processes in the Guarani Aquifer. Understanding the hydrological and contamination processes in detail scale is a key step in order to extrapolate local results to the whole aquifer system, providing reliable information for groundwater management and protection purposes.

Observation: This FAPESP project welcomes researchers from all countries, with different backgrounds and under equal opportunity and merit basis of diversity and inclusion, who will follow both the GRE-USP 2017 criteria and the EESC/USP PPGSHS Graduate Programme PhD 2017 Selection Process.

References: ANACHE, JAMIL A.A. ; WENDLAND, EDSON C. ; OLIVEIRA, PAULO T.S. ; FLANAGAN, DENNIS C. ; NEARING, MARK A. . Runoff and soil erosion plot-scale studies under natural rainfall: A meta-analysis of the Brazilian experience. Catena (Cremlingen), v. 152, p. 29-39, 2017. MELO, DAVI C.D. ; Wendland, Edson . Shallow aquifer response to climate change scenarios in a small catchment in the Guarani Aquifer outcrop zone. ANAIS DA ACADEMIA BRASILEIRA DE CIENCIAS, v. 89, p. 391-406, 2017. MACHADO, ALINE R. ; Wendland, Edson ; KRAUSE, PETER . Hydrologic Simulation for Water Balance Improvement in an Outcrop Area of the Guarani Aquifer System. Environmental Processes, v. 3, p. 1-20, 2016. OLIVEIRA, PAULO TARSO S. ; LEITE, MARCELO BOCCIA ; MATTOS, TIAGO ; NEARING, MARK A. ; SCOTT, RUSSELL L. ; DE OLIVEIRA XAVIER, RAFAEL ; DA SILVA MATOS, DALVA MARIA ; Wendland, Edson . Groundwater recharge decrease with increased vegetation density in the Brazilian cerrado. ECOHYDROLOGY, v. 9, p. 1, 2016. MELO, DAVI DE C. D. ; SCANLON, BRIDGET R. ; ZHANG, ZIZHAN ; Wendland, Edson ; YIN, LEI . Reservoir storage and hydrologic responses to droughts in the Paraná River basin, south-eastern Brazil. Hydrology and Earth System Sciences, v. 20, p. 4673-4688, 2016. LUCAS, MURILO ; Wendland, Edson . Recharge estimates for various land uses in the Guarani Aquifer System outcrop area. Hydrological Sciences Journal, v. 60, p. 150320051027000, 2015. OLIVEIRA, PAULO TARSO S. ; NEARING, MARK A. ; MORAN, M. SUSAN ; GOODRICH, DAVID C. ; Wendland, Edson ; GUPTA, HOSHIN V. . Trends in water balance components across the Brazilian Cerrado. Water Resources Research, v. 50, p. n/a-n/a, 2014. Oliveira, P. T. S. ; WENDLAND, E. ; NEARING, M. A. ; SCOTT, R. L. ; ROSOLEM, R. ; DA ROCHA, H. R. . The water balance components of undisturbed tropical woodlands in the Brazilian Cerrado. Hydrology and Earth System Sciences Discussions (Online), v. 11, p. 12987-13018, 2014. Oliveira, P. T. S. ; WENDLAND, E. ; NEARING, M. A. . Rainfall erosivity in Brazil: A review. Catena (Cremlingen), v. 100, p. 139-147, 2013.

More information: http://www.shs.eesc.usp.br/administracao/docente/?d=edson-cezar-wendland
CV: http://lattes.cnpq.br/3893936996168895

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Edson Luiz Silva
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2015/06246-7
FAPESP Contract Period: since 01/07/2016 to 30/06/2021
FAPESP Project: Biorefinery Concept Applied to Biological Wastewater Treatment Plants: Environmental Pollution Control Coupled with Material and Energy Recovery
PPGSHS/EESC-USP Research Field:Wastewater Treatment
Summary of FAPESP Research Project: The main goal of this Research Project is to establish the fundamental bases to apply the biorefinery concept to a biological wastewater treatment plant, with generation of bioenergy and high value-added products. Such conception is based on the use of anaerobic reactors as the core technology in a wastewater treatment plant, mainly because this process generates a broad spectrum of organic acids and solvents in the liquid phase besides hydrogen and methane in the biogas. In this new approach, the wastewater treatment plant, with their reactors and unit operations, is a network of facilities to produce biofuels, power, and chemicals from organic wastewater. Several challenges must be overcome with this approach, including the low concentrations of organic matter in wastewater, leading to low concentration of intermediates and end products, and the complex composition of wastewater, with spatial and temporal variations. The use of mixed microbial cultures, though important and beneficial for anaerobic process, is another drawback for the biorefinery concept, since process control tends to be difficult. In this context, a multidisciplinary research group was formed to establish the scientific and technological fundaments of a biorefinery fed with wastewater aiming at the generation of profitable products and energy besides complying with its main function of mitigating impacts from the release of wastewater into the environment.
Observation:
References: Ottaviano, L M; Ramos, L R; Botta, L S; Varesche, M B A; Silva, Edson Luiz . Continuous thermophilic hydrogen production from cheese whey powder solution in an anaerobic fluidized bed reactor: Effect of hydraulic retention time and initial substrate concentration. International Journal of Hydrogen Energy, v. 42, p. 4848-4860, 2017.
Ramos, L R; Silva, Edson Luiz . Continuous Hydrogen Production from Agricultural Wastewaters at Thermophilic and Hyperthermophilic Temperatures. Applied Biochemistry and Biotechnology, v. 2, p. 846-869, 2017.
Lazaro, C Z; Varesche, M B A; Silva, E.L. Effect of inoculum concentration, pH, light intensity and lighting regime on hydrogen production by phototrophic microbial consortium. Renewable Energy, v. 75, p. 1-7, 2015.
Lazaro, C Z; Varesche, M B A; Silva, Edson Luiz . Sequential fermentative and phototrophic system for hydrogen production: An approach for Brazilian alcohol distillery wastewater. International Journal of Hydrogen Energy, v. 40, p. 9642-9655, 2015; Amorin, E L C; Sader, L T; Silva, E L. Effects of the Organic-Loading Rate on the Performance of an Anaerobic Fluidized-Bed Reactor Treating Synthetic Wastewater Containing Phenol. Journal of Environmental Engineering (New York, N.Y.), v. 04015022, p. 04015022-1-04015022-9, 2015; Santos, S C; Ferreira R, P R; Sakamoto, I K; Varesche, M B A; Silva, Edson Luiz. Continuous thermophilic hydrogen production and microbial community analysis from anaerobic digestion of diluted sugar cane stillage. International Journal of Hydrogen Energy, v. 39, p. 9000-9011, 2014; Santos, S C; Ferreira R, P R; Sakamoto, I K; Varesche, M B A; Silva, Edson Luiz. Hydrogen production from diluted and raw sugarcane vinasse under thermophilic anaerobic conditions. International Journal of Hydrogen Energy, v. 39, p. 9599-9610, 2014.
More information: http://www1.eesc.usp.br/ppgshs/orientador/37/edson-luiz-silva
CV: http://lattes.cnpq.br/9720274214573371

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Eduardo Mario Mendiondo
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2014/50848-9
FAPESP Contract Period: since 01/07/2017 to 30/06/2023
FAPESP Project: National Institute of Science & Technology on Climate Change-II (INCT Mudanças Climáticas-MC-II)
PPGSHS/EESC-USP Research Field: Hydrology & Water Resources Security
Summary of FAPESP Research Project: To attend UN International Decade for Action "Water for Sustainable Development" 2018-2028, this FAPESP Thematic project will address Water Security as an interdisciplinary concept which assesses levels of water risks tolerable for a society under change. Linking key global agendas of: the Sendai Framework for Disaster Risk Reduction 2015-2030 (DRR), the Sustainable Development Goals (SDGs) and the Paris Agreement on Climate Change (COP'21), this FAPESP project will couple IPCC/AR5 scenarios under non-stationarity drivers of urbanization growth, land-use change and biodiversity losses with practical actions of merging DRR and SDGs across the Brazilian territory (see Rossato et al, 2017). This FAPESP multi-institutional project looks for novel scientific knowledge to handle water security's uncertainties (Rodrigues et al, 2015) proactively to: (i) assess safety indicators of water sectors under non-stationary drivers of climate and land use change, (ii) present securitization options for decision-making at river basins, and (iii) establish water strategies at multi-governance levels. Also, this FAPESP thematic project aims to analyse traditional and new water security criteria in critical river basins in Brazil and South America, through adaptation strategies towards resilience and sustainability of water user sectors. The methodology encompasses: (1) Selection of strategic river basins' water security database under change, (2) Calibration/validation of human-water processes under non-stationarity, (3) Simulation of future reference and intervention scenarios merging IPCC/AR5/COP'21, DRR and SDG frameworks at river basin scales, (4) Evaluation of new adaptation strategies of risk transfer models of insurance (Mohor & Mendiondo, 2017), ecosystem-based adaptation (EbA, see i.e. Taffarello et al, 2017) and offsetting water footprint (WF, i.e. Rodrigues et al, 2014), and (5) Proposition of framework for improving water security communication of insurance, EbA and WF tools with river basin's stakeholders.
Observation: This FAPESP project welcomes researchers from all countries, with different backgrounds and under equal opportunity and merit basis of diversity and inclusion, who will follow both the GRE-USP 2017 criteria and the EESC/USP PPGSHS Graduate Programme PhD 2017 Selection Process.
References: Mohor, G. S., Mendiondo, E M (2017) Economic indicators of Hydrologic Drought Insurance Under Water Demand & Climate Change Scenarios in a Brazilian Context, Ecological Economics, DOI: 10.1016/j.ecolecon.2017.04.014; Rossato, L., Marengo, J., Mendiondo, E. M + author (2017) Impact of soil moisture over Palmer Drought Severity Index and its future projections in Brazil, Braz. J. Wat. Res. DOI: 10.1590/2318-0331.0117160045; Taffarello, D., Mohor, G., Guimaraes, J., Calijuri, M. C., Mendiondo, E M (2017) Modelling freshwater quality scenarios with ecosystem- based adaptation in the headwaters of the Cantareira system, Brazil, HESSD-Hydrol. Earth Syst. Sci. Discuss., DOI: 10.5194/hess-2017-474; Rodrigues, D, Gupta, H, Mendiondo, E M, Oliveira, P T (2015) Assessing uncertainties in surface water security: An empirical multimodel, Water Res. Research, DOI: 10.1002/2014WR016691; Rodrigues, D, Gupta, H, Mendiondo, E M (2014) A blue/green water-based accounting framework for assessment of water security, Water Res. Research, doi: 10.1002/2013WR014274
More information: http://www1.eesc.usp.br/ppgshs/orientador/6/eduardo-mario-mendiondo
CV: http://lattes.cnpq.br/5966392470702563

DI Code (GRE): 2348
Graduate Programme: PPG-SHS.
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: José Alberto Domingues Rodrigues.
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project.
FAPESP Project No: 2015/06246-7.
FAPESP Contract Period : since 01/07/2016 to 30/06/2021.
FAPESP Project: Biorefinery Concept Applied to Biological Wastewater Treatment Plants: Environmental Pollution Control Coupled with Material and Energy Recovery.
PPGSHS/EESC-USP Research Field: Biological Wastewater Treatment.
Summary of FAPESP Research Project: The main goal of this Research Project is to establish the fundamental bases to apply the biorefinery concept to a biological wastewater treatment plant, with generation of bioenergy and high value-added products. Such conception is based on the use of anaerobic reactors as the core technology in a wastewater treatment plant, mainly because this process generates a broad spectrum of organic acids and solvents in the liquid phase besides hydrogen and methane in the biogas. In this new approach, the wastewater treatment plant, with their reactors and unit operations, is a network of facilities to produce biofuels, power, and chemicals from organic wastewater. Several challenges must be overcome with this approach, including the low concentrations of organic matter in wastewater, leading to low concentration of intermediates and end products, and the complex composition of wastewater, with spatial and temporal variations. The use of mixed microbial cultures, though important and beneficial for anaerobic process, is another drawback for the biorefinery concept, since process control tends to be difficult. In this context, a multidisciplinary research group was formed to establish the scientific and technological fundaments of a biorefinery fed with wastewater aiming at the generation of profitable products and energy besides complying with its main function of mitigating impacts from the release of wastewater into the environment.
References: (1) Albanez, R.; Chiaranda, B.C.; Ferreira, R.G.; França, A.L.P.; Honório, C.D.; Rodrigues, J.A.D.; Ratusznei, S.M.; Zaiat, M. Biological Treatment and Environmental Compliance of Vinasse For Methane Production in an AnSBBR. Applied Biochemistry and Biotechnology, 178(01): 21-43, 2016. (2) Lovato, G.; Ratusznei, S.M.; Rodrigues, J.A.D.; Zaiat, M. Co-Digestion of Whey with Glycerin in an AnSBBR for Biomethane Production. Applied Biochemistry and Biotechnology, 178(01): 126-143, 2016. (3) Lima, D.M.F.; Lazaro, C.Z.; Rodrigues, J.A.D.; Ratusznei, S.M.; Zaiat, M. Optimization Performance of an AnSBBR Applied to Biohydrogen Production Treating Whey. Journal of Environmental Management, 169(01): 191-201, 2016. (4) Albanez, R.; Lovato, G.; Zaiat, M.; Ratusznei, S.M.; Rodrigues, J.A.D. Optimization, Metabolic Pathways Modeling and Scale-Up Estimative of an AnSBBR Applied to Biohydrogen Production by Co-Digestion of Vinasse and Molasses. International Journal of Hydrogen Energy, 41(45): 20473-20484, 2016. (5) Lovato, G.; Albanez, R.; Stracieri, L.; Zaiat, M.; Ratusznei, S.M.; Rodrigues, J.A.D. Design Study of an AnSBBR for Hydrogen Production by Co-Digestion of Whey with Glycerin: Interaction Effects of Organic Load, Cycle Time and Feed Strategy. International Journal of Hydrogen Energy, 42(15): 9567-9576, 2017.
Observation: This FAPESP project welcomes researchers from all countries, with different backgrounds and under equal opportunity and merit basis of diversity and inclusion, who will follow both the GRE-USP 2017 criteria and the EESC/USP PPGSHS Graduate Programme PhD 2017 Selection Process.
More information: http://www1.eesc.usp.br/ppgshs/orientador/39/jose-alberto-domingues-rodrigues.
CV: http://lattes.cnpq.br/2400983698111640

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Lyda Patricia Sabogal Paz
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): No
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2012/50522-0
FAPESP Contract Period: since 01/01/2013 to 31/12/2017
FAPESP Project: Environmental contamination by protozoa Giardia spp. and Cryptosporidium spp. and Ascaris suum: challenges of detection, removal and inactivation of infective forms.
PPGSHS/EESC-USP Research Field: Environmental Engineering
Summary of FAPESP Research Project: The transmission of waterborne diseases related to water supply for human consumption has been recorded even in developed countries. The authorities' attention has focused on actions related to detection and control of protozoa Cryptosporidium spp. and Giardia spp. since several outbreaks caused by these microorganisms have been reported in recent decades. The main source of water contamination by these pathogens is the disposal of domestic sewage (treated or not) into water that is commonly used as source of supply. In Brazil, the services of collecting, transporting and treating sewage are still poor. The fact has spawned the emergence of several waterborne outbreaks for protozoa in the country. Despite of the advances in the Brazilian research in relation to the detection and treatment of pathogens in the water, there are still many uncertainties related to the efficiency of disinfection, disposal of generated sludge in water treatment and sewage systems, and knowledge of particular species in Brazil and its potential sources of infection. Due to the existing problem, this project aims to assess the environmental contamination generated by the protozoa Giardia spp. and Cryptosporidium spp. and eggs of Ascaris suum, considering the challenges of detection, removal and inactivation of infectious forms. The successful development of this project will suggest methodological basis: i) to evaluate the occurrence of Giardia cysts and Ascaris suum eggs in the soil, ii) to study the removal of protozoa in drinking water and the disposal alternatives of generated sludge after treatment, iii) to evaluate the removal of protozoa in sewage treatment and effluent disposal in surface water, and iv) to guide the best method to assess infectivity caused by protozoa. (AU)
Observation:
References: MACIEL, P. M. F.; SABOGAL-PAZ, L. P. Removal of Giardia spp. and Cryptosporidium spp. from water supply with high turbidity: analytical challenges and perspectives. JOURNAL OF WATER AND HEALTH, v. 14, n. 3, p. 369-378, JUN 2016.
More information: http://www.shs.eesc.usp.br/administracao/docente/?d=lyda-patricia-sabogal-paz CV: http://lattes.cnpq.br/5922933119556718

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Maria Bernadete Amancio Varesche Silva
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2015/06246-7
FAPESP Contract Period: since 01/07/2016 to 30/06/2021
FAPESP Project: Biorefinery Concept Applied to Biological Wastewater Treatment Plants: Environmental Pollution Control Coupled with Material and Energy Recovery
PPGSHS/EESC-USP Research Field: Wastewater Treatment
Summary of FAPESP Research Project: The main goal of this Research Project is to establish the fundamental bases to apply the biorefinery concept to a biological wastewater treatment plant, with generation of bioenergy and high value-added products. Such conception is based on the use of anaerobic reactors as the core technology in a wastewater treatment plant, mainly because this process generates a broad spectrum of organic acids and solvents in the liquid phase besides hydrogen and methane in the biogas. In this new approach, the wastewater treatment plant, with their reactors and unit operations, is a network of facilities to produce biofuels, power, and chemicals from organic wastewater. Several challenges must be overcome with this approach, including the low concentrations of organic matter in wastewater, leading to low concentration of intermediates and end products, and the complex composition of wastewater, with spatial and temporal variations. The use of mixed microbial cultures, though important and beneficial for anaerobic process, is another drawback for the biorefinery concept, since process control tends to be difficult. In this context, a multidisciplinary research group was formed to establish the scientific and technological fundaments of a biorefinery fed with wastewater aiming at the generation of profitable products and energy besides complying with its main function of mitigating impacts from the release of wastewater into the environment.
Observation:
References:
Andrade, M V F; Sakamoto, I K; Corbi, J J; Silva, E L; Varesche, M B A. Effects of hydraulic retention time, co-substrate and nitrogen source on laundry wastewater anionic surfactant degradation in fluidized bed reactors. Bioresource Technology, v. 224, p. 246-254, 2017.
Delforno, T P; Lacerda Júnior, G V; Noronha, M F; Sakamoto, I K; Varesche, M B A; Oliveira, V M. Microbial diversity of a full-scale UASB reactor applied to poultry slaughterhouse wastewater treatment: integration of 16S rRNA gene amplicon and shotgun metagenomic sequencing. MicrobiologyOpen, v. 1, p. e00443-12, 2017.
Delforno, T.P. ; LACERDA, G.V. ; SIERRA-GARCIA, I.N. ; Okada, D.Y. ; MACEDO, T.Z. ; Varesche, M.B.A. ; Oliveira, V.M. . Metagenomic analysis of the microbiome in three different bioreactor configurations applied to commercial laundry wastewater treatment. Science of the Total Environment, v. 587-, p. 389-398, 2017.
Soares, L A; Braga, J K; Motteran, F; Sakamoto, I K; Silva, E L; **Varesche, M B A**. Design and optimization of hydrogen production from hydrothermally pretreated sugarcane bagasse using response surface methodology. Water Science and Technology, v. 76, p. wst2017183-105, 2017.
Macedo, T Z; Delforno, T P; Braga, J K; Okada, D Y; Silva, E L; Varesche, M B A. Robustness and Microbial Diversity of a Fluidized Bed Reactor Employed for the Removal and Degradation of an Anionic Surfactant from Laundry Wastewater. JOURNAL OF ENVIRONMENTAL ENGINEERING, v. 143, p. 04017062-13, 2017.
More information: http://www1.eesc.usp.br/ppgshs/orientador/33/maria-bernadete-amancio-varesche
CV: http://lattes.cnpq.br/2291054769194665

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Marcelo Zaiat
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2015/06246-7
FAPESP Contract Period: since 01/07/2016 to 30/06/2021
FAPESP Project: Biorefinery Concept Applied to Biological Wastewater Treatment Plants: Environmental Pollution Control Coupled with Material and Energy Recovery
PPGSHS/EESC-USP Research Field: Wastewater Treatment
Summary of FAPESP Research Project: The main goal of this Research Project is to establish the fundamental bases to apply the biorefinery concept to a biological wastewater treatment plant, with generation of bioenergy and high value-added products. Such conception is based on the use of anaerobic reactors as the core technology in a wastewater treatment plant, mainly because this process generates a broad spectrum of organic acids and solvents in the liquid phase besides hydrogen and methane in the biogas. In this new approach, the wastewater treatment plant, with their reactors and unit operations, is a network of facilities to produce biofuels, power, and chemicals from organic wastewater. Several challenges must be overcome with this approach, including the low concentrations of organic matter in wastewater, leading to low concentration of intermediates and end products, and the complex composition of wastewater, with spatial and temporal variations. The use of mixed microbial cultures, though important and beneficial for anaerobic process, is another drawback for the biorefinery concept, since process control tends to be difficult. In this context, a multidisciplinary research group was formed to establish the scientific and technological fundaments of a biorefinery fed with wastewater aiming at the generation of profitable products and energy besides complying with its main function of mitigating impacts from the release of wastewater into the environment.
Observation:This is a joint project involving EESC/USP, IQSC/USP, UFSCar and IMT
References: Fuess, L T ; Kiyuna, L S M ; Ferraz, A D N ; Persinoti, G F ; Squina, F M ; Garcia, M L ; Zaiat, . Thermophilic two-phase anaerobic digestion using an innovative fixed-bed reactor for enhanced organic matter removal and bioenergy recovery from sugarcane vinasse. Applied Energy, v. 189, p. 480-491, 2017.
Camiloti, P. R. ; Oliveira, G. H. D. ; Zaiat, M. . Sulfur Recovery from Wastewater Using a Micro-aerobic External Silicone Membrane Reactor (ESMR). Water, Air and Soil Pollution (Print), v. 227, p. 31, 2016.
Moraes, B S; Zaiat, M; Bonomi, A. Anaerobic digestion of vinasse from sugarcane ethanol production in Brazil: Challenges and perspectives. Renewable & Sustainable Energy Reviews, v. 44, p. 888-903, 2015.
Moraes, B S ; Junqueira, T L ; Pavanello, L G ; Cavalett, O ; Mantelatto, P E ; Bonomi, A ; Zaiat, M . Anaerobic digestion of vinasse from sugarcane biorefineries in Brazil from energy, environmental, and economic perspectives: Profit or expense?. Applied Energy, v. 113, p. 825-835, 2014.
More information: http://www1.eesc.usp.br/ppgshs/orientador/28/marcelo-zaiat
CV: http://lattes.cnpq.br/7593950695805418

DI Code (GRE): 2348
Graduate Programme: PPG-SHS
PhD Selection Process: www.eesc.usp.br/ppgshs
Supervisor: Luiz Antonio Daniel
Principal Investigator of FAPESP Project (GRE/FAPESP eligible): Yes
FAPESP Project (CEPID/Thematic/Young Researcher): Thematic Project
FAPESP Project No: 2012/50522-0
FAPESP Contract Period (dd/mm/yyyy): since 01/01/2013 to 31/12/2017
FAPESP Project: *Environmental contamination by Giardia spp. and* Cryptosporidium spp. and by *Ascaris suu*m: challenges of detection, removal and inactivation of infective forms.
PPGSHS/EESC-USP Research Field: Sanitary engineering
Summary of FAPESP Research Project:The transmission of waterborne diseases related to water supply fo human consumption has been recorded even in developed countries. The authorities' attention has focused on actions related to detection and control of protozoa *Cryptosporidium* spp. and *Giardia* spp. since several outbreaks caused by thes microorganisms have been reported in recent decades. The main souce water contamination by these pathogens is the disposal of domestic sewage (treated or not) into water that is commoly used as source of supply. In Brazi, the services of collecting, transporting and treating sewage are still poor. The fact has spawned the emergency of several waterborne outbreaks of protozoa in the country. Despite of the advances in the Brazilian research in relation to the detection and treatment of the pathogens in the water, the are still many uncertainties related to the efficiency of disinfection, disposal o generated sludge in water treatment and sewage treatment, and knouledge of particular species in Brazil and its potential sources of infection. Due to the existing problem, this project aims to assess the environmental contamination generated by the protozoa Giardia spp. and *Cryptosporidium* spp. and eggs os *Ascaris suum*, considering the challenges of detection, removal and inactivation of infectious forms. The succesful development of this project will suggest methological basis: i) to evaluante the occurrence of *Giardia* cysts and *Ascaris suum* eggs in the soil,; ii) to study the removal of protozoa in drinking water and the disposal alternatives of generated sludge after treatment; iii) to evaluate the removal of protozoa in sewate treatment and effluent disposal in surface water. And iv) to guide the best method to assess infectivity caused by protozoa.
Observation: This FAPESP project welcomes researchers from two Brazilian Instituitions – Unicamp and USP, with different backgrounds and under equal opportunity and merit basis of diversity and inclusion, who will follow both the GRE-USP 2017 criteria and the EESC/USP PPGSHS Graduate Programme PhD 2017 Selection Process.
References:
BONATTI, T. R. ; CASTRO, I. C. V. S. ; FRANCO, R. M. B. . checklist of ciliated protozoa from surface water and sediment samples of Atibaia River, Campinas, SP (Southeast Brazil). Revista Brasileira de Zoociências, v. 17, p. 61-74, 2016.
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FAPESP Project: *Spatio-temporal heterogeneity of the microbial community in subtropical reservoirs with different trophic status*
PPGSHS/EESC-USP Research Field: Sanitary engineering
Summary of FAPESP Research Project: Reservoirs are extremely important to the population, because they perform a strategic role in water supply and power generation to urban centers. In addition to these functions, these systems can also be used for irrigation, navigation and recreation. They are complex and dynamic systems and, as part of hydrographic basin, detect all the effects of anthropogenic activities in the region. Eutrophication is one of the effects of these activities, due to the nutrient input arising from use and occupation of the land and from activities performed on the water body. A lot of the studies on the dynamics of nutrients and microbial community were performed in inland waters in temperate environments and in oligotrophic or already eutrophic conditions. There are few studies in subtropical ecosystems and in transition phase of the trophic state. The subtropical reservoirs that will be studied are in continuous and accelerated transition of the trophic state. Another innovation of this project is the use of molecular techniques to characterize the microbial community and experiments in situ of nitrogen assimilation to understand the role of community in the metabolism of this nutrient in subtropical aquatic environment. The spatio-temporal heterogeneity and the diversity of the microbial community and its interations with the abiotic components in these locations will be studied for the purpose of generating information that will deepen the understanding of the eutrophication process in subtropical reservoirs and develop management strategies to mitigate the adverse effects on water quality, ensuring their multiple uses and the maintenance of their environmental services.
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