Newsletter

November 2014 (Issue 24)

Bioproducts and Bioenergy Research Laboratory (BBRL)

BBRL News

2014 Annual Renewable Energy Workshop is scheduled on **November 12th** from 9 a.m. to 3 p.m. at Fisher Auditorium on the the Wooster campus of the Ohio State University**.** The workshop will include presentations, case studies, a trade show and tours of local green energy operations dealing with a variety of technologies — solar, biomass, anaerobic digestion, and bioproducts.
(http://cfaes.osu.edu/news/articles/renewable-energy-workshop-set-for-nov-12-in-wooster)

A new lab of The Bioproducts and Bioenergy Research Laboratory on the second floor of the new FABE building will be ready for moving in at the beginning of 2015. Bioproducts and Bioenergy Research Laboratory will have two labs: one in composting building and one in FABE building.

Chevrolet New 2015 Bi-Fuel Impala that Runs on Biomethane: *quasar energy group* uses organic waste to produce a renewable energy source known as biogas, which is then converted into Compressed Natural Gas (CNG) – one of two fuels that can power the 2015 Chevrolet Bi-fuel Impala. (http://www.quasarenergygroup.com/pages/chevybifuelimpala.html)

New proposal submission

- **John Sheets** submitted a proposal to the Student Research Funding in Energy, Environment and Sustainability.
- **Yu Dang** submitted a proposal to the Coca-Cola Student Sustainability Grants.

BBRL Member Spotlight

Adam Khalaf-Adam graduated with a Bachelor's degree in Ecological Engineering from the FABE department at OSU in the spring of 2014 and he happily joined the BBRL as an M.S. student this fall. This year he is completing his coursework in Columbus before moving to Wooster in the spring to begin research with Dr. Yebo Li. He is currently involved with the EPA P3 Design Competition team as well as the OSU Office of Energy and Environment project team. His interest primarily focuses on waste-to-energy systems, industrial ecology and sustainability. Eventually, he hopes he can work on improving waste stream reuse in industry. For fun, he likes listening to music, cooking and being outdoors.

Upcoming events, deadlines, or grants

Renewable Energy workshop, 11/12/2014

Abstract Submission Deadline for 2015 ASABE meeting: 12/19/2014

Spring semester on-line course registration due: Friday, January 16, 2015

Initial Tuition & Fees Payment Deadline: Monday, January 5, 2015

Journal Club Update

The Journal Club had two meetings in October:

- **John Sheets-** "How to transform the practice of engineering to meet global health needs", *Science* 345,1287 (2014)
- **Yu Dang**-"The ideal biofuel", *Nature*,23 June 2011 VOL 474

Group Seminar

One group seminar was held in October:

- **Juliana Vasco Correa** gave a presentation on her project entitled: "Effect of harvest date on fungal pretreatment and solid-state anaerobic digestion of *Miscanthus sinensis*".

BBRL Research

2014 Peer Reviewed Journal Publications

1. Li, C., Lu, X., Li, T., Tong, X., Li, Y. 2014. Polyurethane foams based on crude glycerol-derived biopolyols: one-pot preparation of biopolyols with branched fatty acid ester chains and its effects on foam formation and properties. *Polymer*. In press.
2. Zhu, J^{+}., Yang, L^{+}., Li, Y. 2014. Comparison of premixing methods for solid-state anaerobic digestion of corn stover *Bioresource Technology*. IF: 5.039. Equal contribution first author. In press.
3. Ge, X., Yang, L., Sheets, J., Yu, Z.T., Li, Y. 2014. Biological conversion of methane to liquid fuels: status and opportunities. *Biotechnology Advances*. IF: 8.905
4. Lee, Y.L., Luo X., Hu, S, Li, Y., Buchheita, R. G. 2014. Corrosion protection studies of crude glycerol-based waterborne polyurethane coating on steel substrates. *ECS Transactions*, 61 (20) 1-14.
5. Xu, F., Wang, Z. Li, Y. 2014. Predicting the methane yield of lignocellulosic biomass in mesophilic solid-state anaerobic digestion based on feedstock characteristics and process parameters. *Bioresource Technology* 173:168-176. IF: 5.039.

6. Hu, S., Li, Y. 2014. Production of polyols and waterborne polyurethane dispersions from biodiesel-derived crude glycerol. *Journal of Applied Polymer Science.* IF: 1.40

7. Li, Y. F., Nelson, M. C., Chen, P. H., Graf, J., Li, Y., Yu, Z. 2014. Comparison of the microbial communities in solid-state anaerobic digesters (SS-ADs) operated at mesophilic and thermophilic temperatures. *Applied Microbiology and Biotechnology.* In press. (IF:3.69)

8. Yang, L., Li, Y. 2014. Anaerobic digestion of giant reed for methane production. *Bioresource Technology 171: 233-239.* IF: 5.039

9. Yang, L., Ge, Xumeng, Wan, C, Yu, F., Li, Y.2014. Progress and perspectives in converting biogas to transportation fuels. *Renewable & Sustainable Energy Reviews* 40: 1133-1152. IF: 5.51

10. Lin, Y., Ge, X., Li, Y. 2014. Solid-state anaerobic co-digestion of spent mushroom substrate with tree trimmings and wheat straw for biogas production. *Bioresource Technology* 169:468-474. IF: 5.039

11. Lin, L, Yang L., Xu, F., Michel F. C., Li, Y. 2014. Side-by-side comparison of solid-state anaerobic digestion and composting of yard trimmings with effluent from liquid anaerobic digestion. *Bioresource Technology* 169:439-446. IF: 5.039

12. Ge, X., Matsumoto, T, Li. Y. 2014. Biogas energy production from tropical biomass wastes by anaerobic digestion. *Bioresource Technology 169:38-44*. IF: 5.039

13. Xu, F., Wang, Z. W., Tang, L., Li, Y. 2014. A mass diffusion-based interpretation of the effect of total solids content on solid-state anaerobic digestion of cellulosic biomass. *Bioresource Technology.167: 178–185.* IF: 5.039

14. Hu, S., Li, Y. 2014. Polyols and polyurethane foams from acid-catalyzed biomass liquefaction by crude glycerol: effects of crude glycerol impurities. *Journal of Applied Polymer Science* 131(18): 9054-9062. IF: 1.40

15. Luo, X., Li, Y. 2014. Synthesis and characterization of polyols and polyurethane foams from PET waste and crude glycerol. *Journal of Polymers and the Environment* 22(3): 318-328. IF: 1.50

16. Hu, S., Li, Y. 2014. Polyols and polyurethane foams from base-catalyzed liquefaction of lignocellulosic biomass by crude glycerol: effects of crude glycerol impurities. *Industrial Crops and Products*. 57: 188-194. IF: 3.208

17. Hu, S, Li, Y. 2014. Polyols and polyurethane foams from two-step sequential liquefaction of lignocellulosic biomass by crude glycerol. *Bioresource Technology. 161:410–415*. IF: 5.039

18. Zheng, Y., Zhao, J., Xu, F., Li, Y. 2014. Pretreatment of lignocellulosic biomass for enhanced biogas production. *Progress in Energy and Combustion Science*: *42:35-53.* **IF: 16.909**

19. Gómez, E.F., Luo, X.., Li, C., Michel F.C., Li, Y. 2014. Biodegradability of crude glycerol-based polyurethane foams during composting, anaerobic digestion and soil incubation. *Polymer Degradation and Stability 102:195-203.* IF: 2.63

20. Zhao, J., Ge, X. Vasco Correa J., Li, Y.2014. Fungal pretreatment of unsterilized yard trimmings for enhanced methane production by solid-state anaerobic digestion. *Bioresource Technology 158: 248–252.* IF: 5.039.

21. Shi J, Xu F., Wang Z., Stiverson, J. A., Yu Z. Li, Y. 2014. Effects of microbial and non-microbial factors of liquid anaerobic digestion effluent as inoculum for solid-state anaerobic digestion of corn stover. *Bioresource Technology*. *157: 188–196.* IF: 5.039.

22. Zhao, J., Zheng, Y., Li, Y. 2014. Fungal pretreatment of yard trimmings for enhancement of methane yield from solid-state anaerobic digestion. *Bioresource Technology. 156: 176-181.* IF: 5.039

23. Hu, S., Luo, X., Li, Y. 2014. Polyols and polyurethanes from the liquefaction of lignocellulosic biomass. *ChemSusChem* 7: 66–72. IF: 7.12

24. Zhu, J., Zheng, Y., Xu, F., Li, Y. 2014. Solid-state anaerobic co-digestion of hay and soybean processing waste for biogas production. *Bioresource Technology* 154:240-247. IF: 5.039

25. Wang, Z. W., Li, Y. 2014. A theoretical derivation of the Contois equation for kinetic modeling of the microbial degradation of insoluble substrates. *Biochemical Engineering Journal.* 82: 134-138. IF: 2.368

26. Sheets, J., Ge, X., Park, Y. S., Li, Y. 2014. Effect of outdoor conditions on *Nannochloropsis salina* cultivation in artificial seawater using nutrients from anaerobic digestion effluent. *Bioresource Technology.* 152:154-161. IF: 5.039

Accepted with minor/major revision

27. Ge, X., Matsumoto, T., Keith, L. 2014. Fungal pretreatment of albizia chips for enhanced biogas production by solid-state anaerobic digestion. *Energy and Fuel*. IF: 5.039.

28. Yang, L., Xu, F., Ge, X, Li, Y. 2014. Solid-state anaerobic digestion of lignocellulosic biomass: challenges and strategies to resolve them. *Renewable & Sustainable Energy Reviews.* IF: 5.51

29. Park, S.*, Li, Y. 2014 Integration of biological kinetics and computational fluid dynamics to model the growth of Nannochloropsis salina in an open channel raceway. *Biotechnology & Bioengineering* (IF: 4.164).

Under review

30. Luo, X., Tong, X., Li, Y. 2014. Crude glycerol-based multi-branched polyols and waterborne polyurethane coatings. *Progress in Organic Coatings*. IF: *1.848.*

31. Tong, X., Luo, X., Li, Y. 2014. Development of Blend Films from Soy Meal Protein and Crude Glycerol-Based Waterborne Polyurethane. *Industrial Crops and Products*. (IF:3.208*)*

2014 Extension Fact Sheet

1. Li, Y., Wicks, M. 2013. Fungal pretreatment of corn stover fractions for ethanol production, OSU Extension Fact Sheet, AEX 651.1-13.
2. Li, Y., Yang, L. 2014 Converting spent wheat straw from horse stalls into methane. OSU Extension Fact Sheet, AEX 653-14.
3. Yang, L., Li, Y. 2014. Biogas cleaning and upgrading technologies. OSU Extension Fact Sheet, AEX 653.1-14.
4. Li, Y., Yang, L. 2014 Converting biogas to transportation fuels. OSU Extension Fact Sheet, AEX 653.2-14.

2014 Conference Presentation

1. Li, Y. 2014. Fungal pretreatment of lignocellulosic biomass for biofuel and bioenergy production. 2014 Institute of Biological Engineering (IBE) Annual Conference. Lexington, KY. March 6-8, 2014.
2. Luo, X., Li, Y. 2014. Synthesis and characterization of crude glycerol derived multi-armed epoxy compounds. 2014 American Chemical Society National Meeting and Exposition. Dallas, TX. March 16-20, 2014.
3. Lin, L., Yang, L., Xu, F., Li, Y. 2014. A side-by-side comparative study of solid-state anaerobic digestion and composting using yard waste and liquid anaerobic digestion effluent. 2014 OARDC Annual Conference. Wooster, OH. April 24, 2014.
4. Tong, X., Luo, X., Li, Y. 2014. Development of Waterborne Polyurethane Film from Soymeal and Crude Glycerol. 2014 OARDC Annual Conference. Wooster, OH. April 24, 2014.
5. Luo, X., Tong, X., Li, Y. 2014. Waterborne polyurethane coatings from crude glycerol-based multi-branched polyols. 2014 OARDC Annual Conference. Wooster, OH. April 24,2014.
6. Yang, L., Zhu, J., Li, Y. 2014. Effects of premixing and recovery methods on solid-state anaerobic digestion of corn stover. 2014 OARDC Annual Conference. Wooster, OH. April 24, 2014.
7. Lin, Y., Ge, X., Li, Y. 2014. Co-digestion of spent mushroom substrate, yard waste and wheat straw for enhanced solid-state anaerobic digestion. 2014 OARDC Annual Conference. Wooster, OH. April 24, 2014.
8. Park, S., Li, Y. 2014. Integrated computational fluid dynamics model for open pond cultivation of Nannochloropsis salina using phase change material to increase carbon dioxide retention and thermal stability. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014.
9. Lin, Y., Ge, X., Li, Y. 2014. Co-digestion of spent mushroom compost, yard waste and wheat straw for enhanced solid-state anaerobic digestion. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014. Paper No. 141897552.
10. Lin, L, Yang, L., Li, Y. 2014. Side-by-side comparison of solid-state anaerobic digestion and composting of yard trimmings with effluent from liquid anaerobic digestion. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014. Paper No. 141897526.
11. Racharaks R., Ge, X., Li, Y. 2014. Integration of shale gas wastewater treatment with microalgae-based biofuel production. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014.
12. Xu, F., Wang, Z., Li, Y. 2014. Mathematical modeling of solid-state anaerobic digestion for methane production. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014. Paper No. 141909527
13. Vasco Correa J., Li, Y. 2014. Effect of harvest date on methane production by solid-state anaerobic digestion of Miscanthus sinesis. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014.
14. Zhu, J., Yang, L., Li, Y. 2014. Effects of premixing methods of feedstock and inoculum on solid-state anaerobic digestion of corn stover. 2014 Annual ASABE meeting, Montreal, QC Canada. Jul 13-16, 2014.

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