

บทความที่น่าสนใจประจำเดือนพฤษภาคม 2558

สาขาวิทยาศาสตร์และเทคโนโลยี

1	Title:	Biogas stripping of ammonia from fresh digestate from a food waste digester
	Author:	A. Serna-Maza, S. Heaven, C.J. Banks
	Journal:	Bioresource Technology, Volume 190, August 2015, Pages 66–75
	Abstract:	The efficiency of ammonia removal from fresh source-segregated domestic food waste digestate using biogas as a stripping agent was studied in batch experiments at 35, 55 and 70 °C, at gas flow rates of 0.125 and 0.250 L biogas min ⁻¹ L ⁻¹ digestate with and without pH adjustment. Higher temperatures and alkaline conditions were required for effective ammonia removal, and at 35 °C with or without pH adjustment or 55 °C with unadjusted pH there was little or no removal. Results were compared to those from earlier studies with digestate that had been stored prior to stripping and showed that ammonia removal from fresh digestate was more difficult, with time constants 1.6–5.7 times higher than those previously reported. This has implications for the design of large-scale systems where continuous stripping of fresh digestate is likely to be the normal operating mode. A mass balance approach showed that thermal-alkaline stripping improved hydrolysis.
	Database:	ScienceDirect

2	Title:	Methane Yield Database: Online infrastructure and bioresource for methane yield data and related metadata
	Author:	Boštjan Murovec, Sabina Kolbl, Blaž Stres
	Journal:	Bioresource Technology, Volume 189, August 2015, Pages 217–223
	Abstract:	The aim of this study was to develop and validate a community supported online infrastructure and bioresource for methane yield data and accompanying metadata collected from published literature. In total, 1164 entries described by 15,749 data points were assembled. Analysis of data collection showed little congruence in reporting of methodological approaches. The largest identifiable source of variation in reported methane yields was represented by authorship (i.e. substrate batches within particular substrate class) within which experimental scales (volumes (0.02–5 l), incubation temperature (34–40 °C) and % VS of substrate played an important role (p < 0.05, npermutations = 999) as well. The largest fraction of variability, however, remained unaccounted for and thus unexplained (>63%). This calls for reconsideration of accepted approaches to reporting data in currently published literature to increase capacity to service industrial decision making to a greater extent.
	Database:	ScienceDirect

3	Title:	Effect of plant species on nitrogen recovery in aquaponics
	Author:	Zhen Hu, Jae Woo Lee, Kartik Chandran, Sungpyo Kim, Ariane Coelho Brotto, Samir Kumar Khanal
	Journal:	Bioresource Technology, Volume 188, July 2015, Pages 92–98
	Abstract:	Nitrogen transformations in aquaponics with different edible plant species, i.e., tomato (<i>Lycopersicon esculentum</i>) and pak choi (<i>Brassica campestris</i> L. subsp. <i>chinensis</i>) were systematically examined and compared. Results showed that nitrogen utilization efficiencies (NUE) of tomato- and pak choi-based aquaponic systems were 41.3% and 34.4%, respectively. The abundance of nitrifying bacteria in tomato-based aquaponics was 4.2-folds higher than that in pak choi-based aquaponics, primarily due to its higher root surface area. In addition, tomato-based aquaponics had better water quality than that of pak choi-based aquaponics. About 1.5–1.9% of nitrogen input were emitted to atmosphere as nitrous oxide (N ₂ O) in tomato- and pak choi-based aquaponic systems, respectively, suggesting that aquaponics is a potential anthropogenic source of N ₂ O emission. Overall, this is the first intensive study that examined the role plant species played in aquaponics, which could provide new strategy in designing and operating an aquaponic system.
	Database:	ScienceDirect

4	Title:	Design of an integrated dryer and conveyor belt for woody biofuels
	Author:	Alberto Alamia, Henrik Ström, Henrik Thunman
	Journal:	Biomass and Bioenergy, Volume 77, June 2015, Pages 92–109
	Abstract:	Combustion or gasification of high-moisture content biomass is associated with a number of drawbacks, such as operational instabilities and lowered total efficiency. The present work proposes an integrated dryer and conveyor belt for woody biofuels with steam as the heat transfer medium. The use of low-temperature steam is favorable from a heat management point of view, but also helps to minimize the risk of fire, self-ignition and dust explosions. Furthermore, the presented dryer design represents an efficient combination of fuel transport, drying equipment and fuel feeding system. The proposed design is developed from a macroscopic energy and mass balance model that uses results from computational fluid dynamics (CFD) fuel bed modeling and experiments as its input. This CFD simulation setup can be further used to optimize the design with respect to bed height, steam injection temperatures and fuel type. The macroscopic model can be used to investigate the integration of the dryer within a larger biomass plant. Such a case study is also presented, where the dryer is tailored for integration within an indirect steam gasification system. It is found that the exergy efficiency of this dryer is 52.9%, which is considerably higher than those of other dryers using air or steam, making the proposed drying technology a very competitive choice for operation with indirect steam gasification units.
	Database:	ScienceDirect

5	Title:	Charting the evolution of biohydrogen production technology through a patent analysis
	Author:	Chiung-Wen Hsu, Pao-Long Chang, Chih-Min Hsiung, Chi-Chih Wu
	Journal:	Biomass and Bioenergy, Volume 76, May 2015, Pages 1–10
	Abstract:	This study models the evolution of technologies for hydrogen production from the fermentation of biomass. We used a patent-clustering method to construct a technology network based on the mutual citation relationships between representative technology patents. Subsequently, we established an approximate matrix by analyzing the density of this citation network and identified the core technology cluster. We evaluated 2125 US patents from 2012 related to fermentative hydrogen production from biomass and divided the patents into four clusters according to their main technological areas. The largest cluster featured “the methods and systems that process useful gas by using waste and wastewater as feedstock and by enhancing biological (e.g., aerobic and anaerobic) processes,” indicating that this technology area currently represents the mainstream technology for such hydrogen production.
	Database:	ScienceDirect

6	Title:	Drought early warning in irrigation area by integrating surface water and groundwater
	Author:	Zhao Liu, Wen-Cheng Huang
	Journal:	Paddy and Water Environment, April 2015, Volume 13, Issue 2, pp 145-157
	Abstract:	The purpose of this paper is to build a drought early warning system for Jinghuiqu Irrigation Area in China. In former research, the authors (Huang and Yuan Water Resour Res 40(6):W064011–W0640113, 2004, Huang and Chou, Water Resour Res 41:2004W, 2005; Adv Water Resour 31(4):649–660, 2008) have developed the drought early warning system by taking multiple hydrological factors into account the practicality and applicability of the model have been verified by series of case study. As far as irrigation area is concerned, precipitation and groundwater should be considered as important factors. The storage and distribution of groundwater is generally more complicated in a region; groundwater table and aquifer condition could change intensively in different areas; it is difficult to assess the level of drought directly. To deal with this problem, different fuzzy membership functions were put forward in this paper according to fluctuation of the groundwater level in a year, that is, the uprising period and descending period. Precipitation was also discussed in this paper for assessing its effects on current drought situation and future water consumption situation. By taking two typical dry years for examples, it was proved that the drought early warning model can be applied very well for drought early warning and drought management on irrigation area by integrated surface water and groundwater.
	Database:	SpringerLink

7	Title:	Experimental evaluation of irrigation methods for soil desalinization
	Author:	Yanyan Dai, Masateru Senge, Kengo Ito, Takeo Onishi, Kohei Yoshiyama
	Journal:	Paddy and Water Environment, April 2015, Volume 13, Issue 2, pp 159-165
	Abstract:	Soil salinization has provided a serious threat for global agriculture throughout human history. It is becoming ever more prevalent as human land use intensifies in recent years, and the reclamation is one of major challenges in agroecology. Flood irrigation is a typical method for leaching saline soil. Yet the practice needs a large amount of water, and it is difficult to remove salt uniformly throughout soil layers. In this study, an experiment was conducted to evaluate leaching efficiencies of four different methods, namely: flood irrigation, spray irrigation, paper-covered flood irrigation, and puddling irrigation. Flood irrigation was applied at three plots with different infiltration capacities. Spray irrigation, paper-covered flood irrigation, and puddling irrigation were applied at other three plots with medium infiltration capacities. Results showed that salt removal rates of flood irrigation tended to be higher near the surface of soil with smaller infiltration capacity, and that spray irrigation, paper-covered flood irrigation, and puddling irrigation were more efficient in removing salt than flood irrigation. Paper-covered irrigation was the only leaching method that reduced horizontal heterogeneities in salt content, while flood irrigation and puddling irrigation significantly increased the horizontal heterogeneities. The present study indicated that leaching efficiencies were highly affected by irrigation intensity and also by irrigation water volume only when irrigation intensity was considerably low, and that paper-covered irrigation is an efficient method in removing salt homogeneously from soil profile. Further studies need to be conducted to optimize irrigation intensity and water volume for given soil and water environmental conditions.
	Database:	SpringerLink

8	Title:	Natural albumin/tannin cellular foams
	Author:	C. Lacoste, M.C. Basso, A. Pizzi, A. Celzard, M-P Laborie
	Journal:	Industrial Crops and Products, Volume 73, 30 October 2015, Pages 41–48
	Abstract:	Albumin/tannin-based foams were prepared under alkaline or acid conditions by whipping up a water solution of a protein, egg albumin, mixed with a second water solution of condensed flavonoid tannins. Foam formulations with 4 different condensed tannin bark extracts and different relative proportions of protein and tannin were developed with a rapid foaming process where the protein has a double function: co-reagent and surfactant as well. Physical properties such as mechanical performance, thermal conductivity, and porous structure were characterised to identify the large potential of applications of these new cellular foams, fully bio-based and probable easier biodegradability. Moreover, some albumin-based foams were found to be completely flexible in certain conditions.
	Database:	ScienceDirect

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Title:	Oregano and lavender essential oils as antioxidant and antimicrobial additives of biogenic gelatin films
Author:	J.F. Martucci, L.B. Gende, L.M. Neira, R.A. Ruseckaite
Journal:	Industrial Crops and Products, Volume 71, September 2015, Pages 205–213
Abstract:	The chemical composition of the essential oils obtained by hydrodistillation from fully-formed, dried oregano leaves (<i>Origanum vulgare</i>) and lavender leaves and flowers (<i>Lavandula officinalis</i>) were analyzed by GC/MS. The effectiveness of oregano (OEO) and lavender (LEO) essential oils and a mixture LEO:OEO (50:50) in inhibiting <i>Escherichia coli</i> and <i>Staphylococcus aureus</i> growth were determined. Both essential oils inhibited the growth of the microorganisms tested, being more sensitive to gram-positive bacteria. OEO yielded the lowest values of minimum inhibitory concentration (MIC _{OEO} = 1600–1800 ppm vs. MIC _{LEO} = 2000 ppm against <i>E. coli</i> ; MIC _{OEO} = 800–900 ppm vs. MIC _{LEO} = 1000–1200 ppm against <i>S. aureus</i>), due to the higher content of phenolic compound, which also provides antioxidant capacity (IC ₅₀ _{OEO} = 297 ± 89 ppm vs. IC ₅₀ _{LEO} >> 6000 ppm). Mixture results indicated an antagonist antimicrobial effect between OEO and LEO. Gelatin-based films added with OEO or LEO, were prepared by casting (2000–6000 ppm). Mechanical, optical and water vapor barrier properties were determined to observe film functionality. OEO effect on the functional properties of gelatin films was not significant. LEO, in the highest concentration analyzed, promotes a slight change in water vapor permeability of Ge-based films (1.46×10^{-13} to 6.8×10^{-14} Kg.m/Pa.s.m ²), due to its high hydrophobic nature. Oregano containing gelatin films exhibited the highest antimicrobial and antioxidant properties.
Database:	ScienceDirect

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Title:	Olive by-products: Challenge application in cosmetic industry
Author:	Francisca Rodrigues, Filipa B. Pimentel, M. Beatriz P.P. Oliveira
Journal:	Industrial Crops and Products, Volume 70, August 2015, Pages 116–124
Abstract:	Olive tree is a traditional plant which fruits (<i>Olea europaea</i> L.) are used for olive oil production, especially in Mediterranean countries. Olive oil extraction produces by-products, which can become a major environmental issue. Recently, some studies have been carried out on these residues regarding phytochemical identification and biological and toxicological evaluation. The bioactive compounds contained by these by-products have a high antioxidant activity (especially oleuropein), a characteristic fatty acids profile and an interesting mineral composition. Indeed, taking into account its composition and sustainability issues, the reuse of these disposal residues is advisable. These agro-industrial by-products have the potential to be used with different purposes, providing economical advantage. In particular, the field of skin care products and cosmetics may benefit from these remaining materials, as those bioactive compounds can fulfill a real cosmetic function and activity. This

review presents the composition of the different olive by-products and their bioactive compounds. The possible application of these wastes as cosmetic ingredients was critically reviewed.

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