SUGARS (incl. Natural sweeteners, Jaggery, Palm sugar, Honey, etc.)

NPARR 2(1), 2011-093, **Comparison of alkaline pulping with steam explosion for glucose production from rice straw**

Agricultural residues, such as rice straw, are renewable, largely unused, and abundantly available resources. They contain cellulose and hemicellulose, which could be used to produce ethanol and many other value-added products. The current research investigates the utilization of rice straw as a lignocellulosic biomass feedstock to produce a value-added product. Investigation was carried to convert the rice straw into glucose which can be further fermented to produce ethanol. Different pretreatment methods, such as chemical pretreatment process using alkaline pulping and steam explosion were applied in this study to pretreat the lignocellulosic biomass. A Spezyme CP® cellulase enzyme was used in the experiment to hydrolyze the pretreated material into glucose. The total reducing sugars produced from the enzymatic hydrolysis of cellulose was measured by the dinitrosalicylic acid (DNS) method. The data from the enzyme hydrolysis time study were analyzed to provide information on enzyme hydrolysis rates. The results indicated that 28.9–58.4 g/L of glucose can be produced from rice straw depending on the pretreatment method [Maha M. Ibrahim*, Waleed K. El-Zawawy, Yasser R. Abdel-Fattah, Nadia A. Soliman and Foster A. Agblevor (National Research Center, Cellulose and Paper Department, El-Tahrir St., Dokki, Cairo, Egypt), *Carbohydrate Polymers*, 2011, **83**(2), 720-726].

NPARR 2(1), 2011-094, **A study on chemical constituents and sugars extraction from spent coffee grounds**

Spent coffee grounds (SCG), the residual materials obtained during the processing of raw coffee powder to prepare instant coffee, are the main coffee industry residues. In the present work, this material was chemically characterized and subsequently submitted to a dilute acid hydrolysis aiming to recover the hemicellulose sugars. Reactions were performed according to experimental designs to verify the effects of the variables H_2SO_4 concentration, liquid-to-solid ratio, temperature, and reaction time, on the efficiency of hydrolysis. SCG was found to be rich in sugars (45.3%, w/w), among of which hemicellulose (constituted by mannose, galactose, and arabinose) and cellulose (glucose homopolymer) correspond to 36.7% (w/w) and 8.6% (w/w), respectively. Optimal conditions for hemicellulose sugars extraction consisted in using 100 mg acid/g dry matter, 10 g liquid/g solid, at 163 °C for 45 min. Under these conditions, hydrolysis efficiencies of 100%, 77.4%, and 89.5% may be achieved for galactan, mannan, and arabinan, respectively, corresponding to a hemicellulose hydrolysis efficiency of 87.4% [Solange I. Mussatto*, Livia M. Carneiro, João P.A. Silva, Inês C. Roberto and José A. Teixeira (IBB - Institute for Biotechnology and Bioengineering, Centre of Biological Engineering, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal), *Carbohydrate Polymers,* 2011, **83**(2), 368-374].

NPARR 2(1), 2011-095, **Residues of organochlorine pesticides in honeys from different geographic regions**

Organochlorine pesticides (OCPs) are of concern due to their presence in foods. Hexachlorocyclohexanes (HCHs), dichlorodiphenyltrichloroethanes (DDTs), chlordane and hexachlorobenzene (HCB) in 38 honey samples from different geographic regions were analyzed with gas chromatography/ion trap mass spectrometry after accelerated solvent extraction. Mean concentrations of total HCHs (SHCHs), SDDTs, Schlordanes, and HCB in tested honeys were 2.23, 1.14, 0.45, and 0.17 ng g^{-1}, respectively. Concentration ranges of SHCHs, SDDTs, and Schlordanes and HCB were 0.21–8.70, 0.10–4.35, 0.02–3.75, and nd–1.16 ng g^{-1}, respectively, in the 38 honey samples. Honey samples from developing countries generally contained higher concentrations of ΣHCHs, ΣDDTs, Σchlordanes, and HCB than those from developed countries. A comparison of the ratios of highest and lowest concentrations of ΣHCHs, ΣDDTs, Σchlordanes, and HCB in those honeys showed relative evenness of concentrations of the OCPs in honeys from developing countries and large variation in honeys from developed countries [Jun Wang, Michael M. Kliks, Soojin Jun and Qing X. Li* (Department of Molecular Biosciences and Bioengineering,

University of Hawaii at Manoa, Honolulu, Hawaii 96822, United States), *Food Research International*, 2010, **43**(9), 2329-2334].

NPARR 2(1), 2011-096, **Effect of honey powder on dough rheology and bread quality**

The effects of honey powder on dough rheology and bread quality were studied using sugar as controls. Farinographic studies showed that there were higher water absorption, shorter development time and stability time as honey powder increased, and small degree of softening were obtained for the dough containing 5% honey powder. Extensograph measurements showed that resistance to extension and R/E increased while energy value and extensibility decreased at level of 10% honey. Sensory evaluation showed that the largest total scores were obtained at level of 10% honey. Texture analysis showed that honey breads had low hardness, adhesiveness, gumminess, chewiness and high springiness, cohesiveness. The differences of the crust and crumb colour between honey breads and the control were significant ($P<0.05$). In conclusion, honey powder could be potentially a useful ingredient as a dough improver. Honey usage in the bread formulation supported an improvement in dough rheology, better sensory and texture properties of bread as compared to control formulation. Addition of 5%–10% honey powder significantly improved the baking quality of breads [Qunyi Tong*, Xiaoyu Zhang, Fang Wu, Jingjing Tong, Pinping Zhang and Jing Zhang (State Key Laboratory of Food Science and Technology, Jiangnan University, Jiangsu Wuxi 214122, China), *Food Research International,* 2010, **43**(9), 2284-2288].

NPARR 2(1), 2011-097, **Determination of royal jelly acids in honey**

In the present work we report on the compounds characteristic of larval food (royal jelly, RJ) of the honeybee (*Apis mellifera* L.) that were identified in 34 different samples of genuine honey and in 3 sugar-adulterated "herbal honeys" by using solid-phase extraction and gas chromatography–mass spectrometry (SPE/GC–MS). The unique feature of RJ is a set of C_8, C_{10} and C_{12} hydroxy fatty acids. In all, ten acids characteristic of this bee product were identified in different combinations in the analysed honey samples, namely: 7- and 8-hydroxyoctanoic, 3-hydroxydecanoic, 9-hydroxydecanoic, 9-hydroxy-2-decenoic, 10-hydroxydecanoic, 10-hydroxy-2-decenoic (10-HDA), 3,10-dihydroxydecanoic, 2-octene-1,8-dioic and 2-decene-1,10-dioic acids. The higher relative abundance of these compounds was determined in genuine honeydew and heather honeys, and in "herbal honeys" (23.8–40.8, 18.2–48.5, and 27.0–48.4 μg/g, respectively). Since RJ is known to have strong antibiotic efficacy, our results suggest that a part of the non-peroxide antibacterial activity of honey might be of bee origin [V.A. Isidorov*, U. Czyżewska, E. Jankowska and S. Bakier (Institute of Chemistry, Białystok University, 15-399 Białystok, Poland), *Food Chemistry*, 2011, **124**(1), 387-391].