ESSENTIAL OILS (incl. Flavour and Fragrance)

NPARR 2(1), 2011-015, **Variations in essential oil yield and composition during *Cinnamomum cassia* bark growth**

To extract essential oil for industrial use, the yields and compositions of bark oil during *Cinnamomum cassia* growth (1–3 years old for the branch bark; 5-12 years old for the stem bark) were determined. The branch bark fraction had a higher essential oil yield than the whole branch. The essential oil yield from branch bark varied within 2.70-3.11% (w/w), while that from stem bark was 0.41–2.61% (w/w) due to differences in age and segment (top, center and lower) of the tree. There were 41 volatile compounds identified in bark oil, among which the majority presented high fluctuations in percentage of composition both in different growth stages and segments. Variations in oil yields did not present the same pattern as the percentages of trans-cinnamaldehyde. The results suggest that choosing bark according to trees' growth stages and separating stem barks into top, center and lower sections within a tree should significantly improve the extraction efficiency. [Shilei Geng*, Zhaoxue Cui, Xinchao Huang, Yufen Chen, Di Xu and Ping Xiong, (College of Life Science, South China Agricultural University, Guangzhou Guangdong 510642, China), *Industrial Crops and Products*, 2011, **33**(1), 248-252].

NPARR 2(1), 2011-016, **Volatile profiles of aromatic and non-aromatic rice cultivars using SPME/GC–MS**

Rice (*Oryza sativa* L.) is enjoyed by many people as a staple food because of its flavour and texture. Some cultivars, like scented rice, are preferred over others due to their distinctive aroma and flavour. The volatile profile of rice has been explored by other investigators, some of whom have also determined a corresponding aroma using GC/olfactometry. However, little research has been done to determine if different aromatic rice cultivars produce different flavour volatiles that would make them more desirable than others when cooked. In this study, seven aromatic and two non-aromatic cultivars were examined for their volatile profiles both before and after storage using solid phase microextraction (SPME) fibres in conjunction with gas chromatography/mass spectrometer (GC–MS). Ninety-three volatile compounds were identified, 64 of which had not been previously reported in rice. Differences were found in the volatile compounds of aromatic and non-aromatic rice besides 2-acetyl-1-pyrroline (2-AP). Most of the volatile compounds were present in freshly harvested rice and rice following storage, with very few new compounds being identified only after storage. Dellrose, an aromatic cultivar, and Cocodrie, a non-aromatic cultivar, had the most complex volatile profiles (over 64 volatiles). Sixteen compounds were found only in the aromatic cultivars, and some volatiles were found to be unique to specific aromatic cultivars. However, no distinctive pattern was observed that would identify a cultivar as being derived from Basmati, Khao Dawk Mali 105 (i.e. jasmine), or other sources of aroma. This study showed that there is a great diversity of volatiles in both aromatic and non-aromatic rice cultivars and, with further research, this may lead to a better understanding of the combination of compounds that gives a cultivar a unique flavour [R.J. Bryant*and A.M. McClung (USDA-ARS, Dale Bumpers National Rice Research Center, 2890 Hwy 130 E., Stuttgart, AR 72160, USA), *Food Chemistry*, 2011, **124**(2), 501-513].

NPARR 2(1), 2011-017, **Supercritical fluid extracts from the Brazilian cherry (*Eugenia uniflora* L.): Relationship between the extracted compounds and the characteristic flavour intensity of the fruit**

Supercritical carbon dioxide (SC-CO_2) extractions of Brazilian cherry (*Eugenia uniflora* L.) were carried out under varied conditions of pressure and temperature, according to a central composite 2^2 experimental design, in order to produce flavour-rich extracts. The composition of the extracts was evaluated by gas chromatography coupled with mass spectrometry (GC/MS). The abundance of the extracted compounds was then related to sensory analysis results, assisted by principal component and factorial discriminant analysis (PCA and FDA, respectively). The identified sesquiterpenes and ketones were found to strongly contribute to the characteristic flavour of the Brazilian cherry. The extracts also contained a variety of other volatile compounds, and part of the fruit wax contained long-

chain hydrocarbons that according to multivariate analysis, contributed to the yield of the extracts, but not the flavour. Volatile phenolic compounds, to which antioxidant properties are attributed, were also present in the extracts in high proportion, regardless of the extraction conditions [Felipe S. Malaman, Luiz Alberto B. Moraes, Caroline West, Nilson J. Ferreira and Alessandra L. Oliveira*(Departamento de Engenharia de Alimentos, Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo, Av. Duque de Caxias Norte, 225, 13635-900 Pirassununga, SP, Brazil), *Food Chemistry*, 2011, **124**(1), 85-92].

NPARR 2(1), 2011-018, **Volatile flavour profile changes in selected field pea cultivars as affected by crop year and processing**

The objectives of this study were to evaluate the effect of cultivar, crop year and processing (dry milling, cooking and dehulling) on volatile flavour compounds of field peas using an optimised headspace-solid phase microextraction gas chromatography–mass spectrometry method. Significant differences in area counts of volatile compounds were observed between the different cultivars as well as in area counts of volatile compounds of each cultivar grown in different crop years. Results showed significant reduction in total area counts (TAC) of volatile compounds after cooking and dehulling the seeds. Major differences between whole seeds, cooked and dehulled seeds were found in aldehydes, alcohols, and ketones. Cooked–dehulled peas had the least TAC (7.83E±05) of the volatile compounds compared to the milled-whole peas (6.36E±06), cooked-whole peas (2.00E±06) and milled–dehulled peas (4.33E±06). The results suggest that volatile flavour compounds of different field peas were affected by the cultivar, crop year as well as processing conditions [Sorayya Azarnia, Joyce I. Boye*, Tom Warkentin, Linda Malcolmson, Hassan Sabik and Anne Sophie Bellido (Agriculture and Agri-Food Canada, Food Research and Development Centre, St-Hyacinthe, QC, Canada J2S 8E3), *Food Chemistry***,** 2011, **124**(1), 326-335].