Honours, Masters and PhD Project(s) and Scholarships

An opportunity exists for 1 or more students to undertake work towards the degree of Hons, MPhil or PhD through a study of traditional practices by Australian Aboriginal people in producing fermented foods and beverages

Title Aboriginal practices in food/beverage fermentations

Department: Wine and Food Sciences, Waite Campus, University of Adelaide, (others TBA)

Project Supervisor: Prof Vladimir Jiranek, (others TBA)

Background

It is not widely recognised that Aboriginal people and Torres Strait Islanders practiced fermentations that resulted in alcoholic beverages, albeit likely of low alcohol strength. In fact fermented drinks were made from several plant materials and extracts including tree saps and roots, banksia flowers or roasted, ground nuts of the spiral pandanus. Other naturally sugar-rich materials may also have been used. A comprehensive survey of the knowledge of such processes, let alone a study of ongoing practices has not be conducted. This project seeks to capture details about the scope of fermentations conducted by Aboriginal people from across Australia. Of primary interest is the identification of such fermentation practices, the typical raw materials and their processing, the chemical composition of the pre-fermentation substrate, the mode of inoculation, the yeast and bacterial species responsible for the fermentation, and an analysis of the finished products in terms of their chemistry and sensory properties. Information about the cultural significance of production and consumption would also be of interest. Preliminary investigations of the cider gum (*Eucalyptus gunnii*) from the central Tasmanian highlands has already reveals a vast number of what are apparently entirely new species of yeast.

Research Plan

The project will initially survey regional groups of Aboriginal people to identify the range of fermentations practiced previously or currently and the substrates used for these. With agreement and cooperation with key Aboriginal groups a representative selection of substrates/processes will be investigated. The work will likely require visits to regional sites to investigate Aboriginal fermentation practices, interview the practitioners and collect samples. Chemical composition and aroma/flavour compound profiling with be performed by HPLC, GC- and LC-MS chromatographic methods, much as used currently for wine analysis. Yeast and bacterial populations will be sampled at intervals through the processes, representative species isolated and identified by standard microbiological methods as well as by PCR and genome sequencing. Metagenomic analysis (i.e. sequencing directly from field samples) will also be used. Some processes will be recreated under laboratory conditions with appropriately collected materials and isolated microbes, to aid in the characterisation of each. Fermented products will be subjected to sensory evaluation, again analogous to that used for wine analysis.

Research Team

Depending on the final project scope and interest from Aboriginal communities and potential candidates, the work will be conducted by one or more Hons, MSc or PhD students. In the case of multiple students, the possibility exists for the research to split into two or more closely collaborating efforts broadly along i) fermentation, microbiological and beverage analytical lines and ii) anthropological and ethnobotanical lines. The supervisory panel will be comprised of researchers of relevant expertise, from within the University and collaborating institutions.

Applicant Background and Skills Development

In its most comprehensive form, the project promises to offer training in a breadth of skills across the projects including literature searching, experimental design, interviews, field sample collection and processing, microbiology, botany, anthropology, molecular biology, genomic methods and bioinformatics, chemical and sensory analysis, as well as written and oral scientific communication and presentation skills.

Applicants are sought with tertiary degrees in a relevant field (for Honours and Master) and for study toward a PhD, with research experience (Honours or Masters or equivalent) in one or more of the key areas identified above. In the case of there being only a single suitably qualified applicant, the project can be tailored somewhat to match the student's interests and experience, although the microbiological and chemical analyses are priorities of this work.

Scholarships

A $3,000 Honours scholarship is currently available. Also the student will be supported to secure further available scholarships.

A top-up scholarship for an MPhil or PhD of $5,000 pa will also be made available to a suitably qualified student.

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