

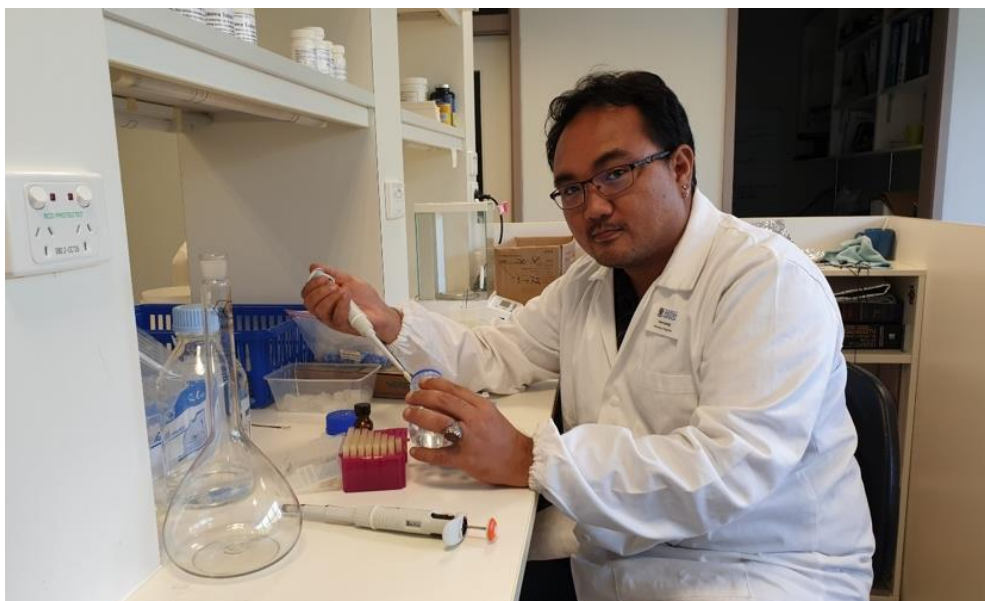
# Honey and pollen antioxidant activity

**CRC for Honey Bee Product researchers explored the antioxidant activity of Western Australian honey and bee pollen and the phytochemicals responsible for this bioactivity.**

Antioxidant activity in food products reduces free radicals and other reactive oxygen and nitrogen species in our bodies that contribute to chronic diseases. It may also have other beneficial health effects, such as cell maintenance and DNA repair. Natural products with antioxidant activity are therefore highly sought after.

Honey has antioxidant properties that result from various constituents, including phenolic compounds. There is a strong link between honey's total phenolic content and its antioxidant activity. Phenolic compounds are found within the non-sugar portion of honey and make up approximately 0.5% of honey's weight.

**CRC researchers developed or optimised a range of methods to determine the antioxidant activity of honey and bee pollen and the phytochemicals responsible for this bioactivity.**



CRC PhD student Ivan Lawag working in the UWA pharmaceutical laboratory



**CRC HBP**  
FOR HONEY BEE PRODUCTS



bioactive  
honey



chemical  
analysis



quality  
product





These methods include:

- an assessment of the total phenolic content of honey
- routine analysis of the antioxidant activity of honey and bee pollen by ferric reducing antioxidant power and 2,2-diphenyl-1-picryl-hydrazyl-hydrate (DPPH) assays
- a protocol to maximise the extraction of antioxidant components from pollen
- a high performance thin layer chromatography (HPTLC) derived database of (mainly) phenolic compounds to identify honey constituents.

**Using these methods, CRC researchers analysed the antioxidant activity of more than 400 honey and 25 bee pollen samples.**

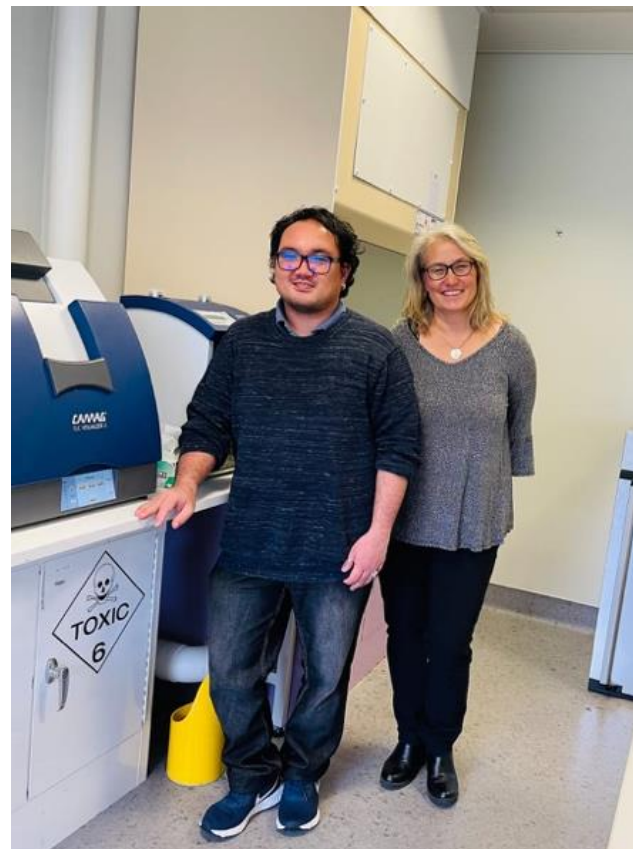
This generated rich data on a diverse range of Western Australian honeys and bee pollen, contributing to the Australian honey library.

These methods were also employed in extensive short- and long-term honey stability studies to provide important information on the impact of handling and storage on honey quality.

Australian honey is rich in phenolics. However, very few phenolics have been chemically identified from honey sources. CRC researchers reviewed the phenolic constituents reported from honey around the world and how they differ depending on the honey's floral nectar source.

The comprehensive HPTLC database established by CRC researchers will help identify and quantify some honey constituents. Already, the database has enabled the identification of several compounds in Australian honey.

Employing HPTLC analysis coupled with DPPH assays, CRC researchers have assessed the contribution of individual honey constituents to total antioxidant activity. This provides the Australian honey industry with a new tool to identify key bioactive honey constituents.



CRC researchers Ivan Lawag and Associate Professor Connie Locher in the UWA laboratory