



10 Minutes for the Planet

Life is sweet: honey and pollution ©

by Sarah Heath

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Hello! I'm Sarah Heath and you're listening to 10 Minutes for the Planet on EnglishWaves.

The plight of world bee populations is already well-documented and the frantic race to save our buzzing little friends has become rightly, an international preoccupation: without their help, bees including honey bees, pollinate around a third of crops globally as well as 80% of European wildflowers, so their presence cannot be underestimated.

Bee numbers have declined drastically in recent years through climate change, disease, pesticides, and the reduction of natural habitats. As one among this species, honey bees – proper name *Apis Mellifera* – have now, unwittingly become a new source of environmental information, in providing data to researchers on air pollution. This study, which is the first of its kind, was embarked upon by scientists from the University of British Columbia in Canada.

In order to compile data on air pollution in major cities and to then determine the origins of that pollution, a research study was launched to examine the honey made by honey bees living in beehives in six locations around the city of Vancouver.

Results published in the journal, *Nature Sustainability*, confirm that honey can be considered a geochemical biomonitor by providing what the research team call a "localised snapshot" of the environment. The honey is examined for different pollutants, the provenance of which can then be traced by the researchers.

The University's Pacific Centre for Isotopic and Geochemical Research have discovered that honey produced locally to the Port of Vancouver revealed higher-than-usual traces of lead. The honey was put through a variety of isotope tests to check for minute particles of chemical elements such as lead, zinc and copper. Analysis proved that the lead originated from Asia, almost certainly from cargo ships which arrive in huge and regular numbers from Asia-Pacific into the port.

Honey bees look for pollen and nectar in an area of roughly 3km around their hive. This piece of research showed that honey from hives in more industrial areas had higher levels of lead than honey tested in more rural areas.

This new technique is a back up to more traditional monitoring techniques and needs little specialist equipment, making studies easier to perform thus facilitating and encouraging scientists who want to investigate sources of pollution in the field of urban geochemistry.

And for the honey bees themselves, unaware of the information they are providing, which may ultimately be for the benefit of their own species, scientists have also been able to prove other amazing bee skills!

Melittology, the study of bees, has shown that honey bees can learn to add and subtract. When put through a range of tests, scientists reported that the bees, some of whom were “taught” achieved the correct answer between 64% and 72% of the time. Their mathematical skills also include a recognition of zero as a number, as proven by scientists at the University of Melbourne.

Additionally, they can be taught how to work for a reward which they then demonstrate to others within the hive. Their communication skills using their body – largely through what is known as a “waggle” – direct others within the nest to find food sources in relation to the position of the sun. They use the same figure-of-eight movement to point their friends in the right direction when they need to move the swarm.

Honey bees are not among the most endangered of the 25,000 species of bee although as with all bee populations, they have had to overcome challenges. Thankfully, action is being taken to prevent their disappearance: a year ago, after consultation with the European Food Safety Authority, the EU finally signed off a ban on three particular chemicals used by farmers which contain neonicotinoids – chemicals which are particularly harmful to honey bees.

The success is such that it is now being reported that there is an imbalance in the number of honey bees, who are being categorised as playing a major driving role in agriculture. Their pervasiveness is beginning to upset delicate environmental ecosystems in rural areas. But maybe their new-found use in helping the environment in other ways through testing air pollution via their honey, might somehow redress the balance? Honey bees assisting in environmental research while simultaneously producing delicious honey – a win-win.

Tune in next week for more stories on the environment, here on English Waves.