

Pesticides found in penguin colonies

New research has found that Adélie penguin colonies in Antarctica magnify the contamination of surrounding soil with toxic pollutants originating from other parts of the world.

These 'persistent organic pollutants' include pesticides such as DDT and chlordane, and cooling and insulating fluids like PCBs (polychlorinated biphenyls). These chemicals are manufactured and used in warmer regions of the world, where they evaporate, get transported through the atmosphere, and then condense over cooler regions, including Antarctica.

Now an international team of scientists, including Dr Martin Riddle from the Australian Antarctic Division, has found that Adélie penguins, which spend all their life in Antarctica, also contribute to the 'concentration' of persistent organic pollutants in their local environment. The pollutants are concentrated in the bodies of animals through a process known as 'biomagnification' – where the levels of chemicals, present at low concentrations in the environment, gradually increase as they are passed up the food chain – and are then excreted.

The scientists analysed soil samples from around three Adélie penguin colonies at Hop Island, near Davis, and three Antarctic reference sites away from any penguin activities. They found the concentrations of persistent organic pollutants to be 10-120 times greater in samples from the penguin colonies, compared to the reference sites. The concentrations of DDT and chlordane,

for example, were 70 and 120 times greater, respectively, in the penguin colony samples. The scientists also found high concentrations of the pollutants in penguin eggs.

'Because the penguins do not travel outside the Antarctic region, it is clear that they are concentrating pollutants that have already been transported into the region, through water or atmospheric deposition, and then further concentrating them when they come together in large numbers at their breeding sites,' Dr Riddle says.

'By concentrating these chemicals they are creating local "hot spots" of contamination.'

A comparison of Antarctic soil samples with Arctic soil samples, however, has shown that overall levels of the pollutants are lower in Antarctic soils.

Global transport by evaporation and condensation is a one-way means of transferring persistent organic pollutants to the cold parts of the planet. Dr Riddle says this new information significantly adds to the overall picture of where in the global environment these persistent contaminants will eventually end up.

WENDY PYPER
Information Services, AAD



Persistent organic pollutants are concentrated in the soil around Adélie penguin nests and in the birds' eggs.

More information

L. Roosens, N. Van Den Brink, M. Riddle *et al* (2007). Penguin colonies as secondary sources of contamination with persistent organic pollutants. *J. Environ. Monit.*, 9: 822-825.

Pesticides found in penguin colonies:
www.aad.gov.au/default.asp?casid=33775

Hop Island in Antarctica, where the scientific study was conducted.

