

Science for Environment Policy

Sparrows could be used to monitor air pollution

House sparrows have the potential to become indicators of air quality, according to a recent Spanish study. The researchers demonstrated that small blood samples taken from the sparrows varied significantly depending on pollution levels in the birds' habitat.

Air pollution has been linked to serious human [health](#) problems such as lung cancer and heart disease and can also damage ecosystems. As the number of people living in [urban environments](#) rises, monitoring and controlling air pollution and its impacts becomes increasingly important. While the levels of pollutants in the air can be monitored it is also useful to assess their physiological effects in living organisms.

In this study, researchers monitored the effects of air pollution on house sparrows. These birds have the potential to be valuable 'bioindicators' of the toxic effects of air pollution, because they are found in towns and cities around the world and yet will generally remain resident in one particular area for their whole lives.

The researchers selected four sites with different levels of air pollution: two rural sites in the Spanish countryside and two urban areas in and near Madrid. In total, 73 house sparrows were caught and blood samples were taken. Human population density, land use and levels of key air pollutants (carbon monoxide, nitrogen oxides and sulphur oxides) were also recorded at each site.

The researchers then examined levels of haemoglobin and the 'anti-oxidant capacity' of the blood samples. Haemoglobin is a key component of red blood cells, which will be in close contact with any air pollutants the animal breathes in. The 'anti-oxidant capacity' demonstrates the extent to which cells have had to defend themselves from damage due to toxic chemicals that get into the blood stream as a result of air pollution, among other factors.

The results show that sparrows living in the more highly-polluted urban sites had significantly lower haemoglobin concentrations and reduced anti-oxidant capacities. This indicates, say the researchers, that urban sparrows are exposed to higher concentrations of toxic chemicals, very likely as a result of the greater air pollution in these areas.

The researchers conclude that this method could be a useful measure of how air pollution affects animals. Not only are house sparrows particularly suitable as a species, but blood sampling can be carried out easily without harming the bird. However, they also warn that there are many other factors which can affect haemoglobin and anti-oxidant capacity and further studies into the exact relationship between air pollution and these qualities are needed. The group continues with their research and hope to obtain more conclusive results soon.



28 November 2013
Issue 352

**Subscribe to free
weekly News Alert**

Source: Herrera- Dueñas, A., Pineda, J., Antonio, M. T., *et al.* (2013). Oxidative stress of House Sparrow as bioindicator of urban pollution. *Ecological Indicators*.
DOI:10.1016/j.ecolind.2013.08.014.

Contact:
aherreradueas@ucm.es,
bio.ahd@gmail.com

Read more about:
[Air pollution](#),
[Environment and health](#), [Urban environment](#)

The contents and views included in *Science for Environment Policy* are based on independent, peer-reviewed research and do not necessarily reflect the position of the European Commission.

To cite this article/service: "[Science for Environment Policy](#)": European Commission DG Environment News Alert Service, edited by SCU, The University of the West of England, Bristol.