METAL TRACE ELEMENT CONCENTRATIONS IN FEATHERS OF NESTLING AND ADULT ALPINE SWIFTS (*Tachymarptis melba*) FROM SWITZERLAND

Authors: **Cloé Hadjadji**[1], Roger Colominas Ciuró[2], Anne Boos[2], Sylvie Massemin[2], Pierre Bize[1]

[1]Swiss Ornithological institute, Sempach, Switzerland

[2]Université de Strasbourg, CNRS, IPHC, UMR 7178, F-67000, Strasbourg, France

Abstract

Exposure to pollutants, such as toxic non-essential metal trace elements (MTEs: e.g. lead [Pb] or mercury [Hg]) is seen as a growing threat to avian biodiversity. Generally produced by anthropogenic activities, they are likely to cause reproductive, physiological, or behavioral deficiencies in birds. However, other metal trace elements are essential dietary elements (e.g. Calcium [Ca] and zinc [Zn]) that support growth and reproduction. Here, we measured four non-essential (arsenic [As], Cadmium [Cd], Pb, Hg) and ten essential (Ca, cobalt [Co], copper [Cu], chrome [Cr], iron [Fe], potassium [K], sodium [Na], sulfur [S], Zn) MTEs in feathers of Alpine swifts. Data were collected on 38 adults and 40 nestlings from two urban colonies in Switzerland. We assessed MTE concentrations in relation to toxicological reference values, and we looked at relationships of MTEs with body condition (BCI) and reproductive success. Results show that concentrations of Pb were above the toxicological reference value in 10% (4/38) and 20% (8/40) of the feather samples in adults and nestlings, respectively. Concentrations of Hg, Cd, or As were not considered harmful. In adults, BCI was positively correlated with Ca, Mn, and S concentrations, and negatively correlated with Zn concentrations. No correlations were found between MTE concentrations and reproductive success. Therefore, our results highlight Pb exposure as a potential threat in this Swiss population of Alpine swifts. They also suggest that the health of aerial foragers such as swifts may be influenced by their limited access to essential dietary metals as Ca, Mn and S.