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Room: Seminar Room

Air pollution and birds' vitamin levels

Presenting author: **Tapio Eeva**

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Metal pollution can interfere with internal nutrient homeostasis and/or change dietary quality of insectivorous birds. We compared fat soluble vitamin (A, D3, E) levels in egg yolk and nestling plasma of the great tit (*Parus major*) and the pied flycatcher (*Ficedula hypoleuca*) between a polluted area near a Finnish copper-nickel smelter (emitting e.g. Cu, Ni, As, Cd and Pb) and relatively unpolluted control areas. Fresh yolk samples were collected in 2014 and plasma samples from nestlings were taken in 2011, 2014 and 2015. Vitamins were measured by UPLC-MS/MS from plasma and freeze-dried yolk. Presented vitamin levels represent a sum of similar vitamin-like compounds. Yolk vitamin D3 levels were significantly higher in the unpolluted area for both bird species while yolk vitamin A levels showed no difference. Yolk vitamin E levels were too low to be measured. Plasma vitamin A and D3 showed no consistent pattern over the years or between the two species, except that vitamin D3 showed no significant difference between areas. Plasma vitamin E was consistently higher in the polluted area, but significantly so only for the great tit in one year. Lower yolk vitamin D3 levels in the polluted area could indicate higher interference of metals with vitamin D3 metabolism, or dietary differences: calcium availability was better in the polluted area and female birds may have downregulated their D3 levels. Higher plasma vitamin E levels in the polluted area could be a response to higher oxidative stress levels, which have been documented in this area.