

Parental feeding behaviour, mercury accumulation and offspring fitness: a preliminary study in the Lesser black-backed gull (*Larus fuscus*)

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Acquiring and allocating nutritional resources to survival and reproduction are key attributes of life-history variation of organisms, nonetheless a main fitness cost associated with resource acquisition is exposure to environmental contaminants (Stearns, 1992; Fry, 1995). The lesser black-backed gull is a cosmopolitan seabird species particularly known by its opportunistic feeding behaviour, and to display a high individual variation in foraging exploitation of marine and terrestrial food webs, which may interact with contamination burdens accumulated through the year.

The overall aim of this preliminary study was to assess how feeding behaviour of parents could interact with mercury burdens accumulated and be transferred to offspring during the breeding season. Mercury has been reported to biomagnify on marine food webs, causing a varied range of toxic effects on adult birds, from reduced reproductive success (e.g. reduced egg hatchability) to neurological dysfunctions (Sundlof *et al.*, 1994; Gochfeld *et al.*, 2002; Hoffman *et al.*, 2003), nonetheless few studies have addressed the effect of mercury accumulation on offspring fitness.

In order to address this topic, between 2012 and 2013, eggs and feathers (primaries and chick down feathers) as well as breeding data (e.g. clutch size, chicks development, chick survival, amongst others) were collected in a long term study population of *Larus fuscus* in Zeebrugge (Belgium, 51°2'N, 03°11'E). The tips of the first and tenth primaries of 26 breeding females were used to determine proportion of marine and terrestrial habitats exploitation during breeding and wintering seasons, while the tips of the second and ninth feathers were used to determine mercury burdens by atomic absorption spectrometry (AAS) with thermal decomposition. Additionally, mercury burden in egg yolks, down feathers and primaries of chicks (collected just prior to chick fledging) were as well analysed using the same principle.

Data obtained enabled us to distinguish different female feeding strategies, from exclusive marine feeders to females with clear terrestrial preferences. Similarly, preliminary mercury burden data was also observed to vary between females and, additionally, be transferred to eggs and chicks during breeding season. These data suggest that parental feeding habits may, indeed, influence exposure risk of chicks to mercury contamination in the environment.

References

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